WTCI-479-P

THE PORT OF NEW YORK AUTHORITY

CONFORMED

PDG
RH

THE WORLD TRADE CENTER

CONTRACT WTC-320.00

ELEVATORS AND ESCALATORS

AUGUST 15, 1967

BOOK II

Note: Revised December 10, 1969 to incorporate WTC-326.00
AKS
SVW

Books I and III, separately bound booklets, also form part of this Contract.

CHAPTER II

ELEVATORS

30. GENERAL

The Contractor hereby assumes responsibility for designing and constructing the elevators so that they operate in accordance with the operational results provided for in the Specifications in their present form, without compensation in addition to the Sale price and the Work price and notwithstanding the fact that any design, method, Materials or equipment necessary for performing the Sale and the Work provided for in the Specifications and Contract Drawings are inadequate to accomplish such operational results or that the operational results are beyond the state of the art of elevator manufacture as of the date of execution of this Contract, and the Contractor shall at his own expense make such changes in the design, methods, Materials or equipment specified for performing the Sale and the Work and furnish and install such additions as may be necessary to accomplish the operational results provided for in the Specifications, subject to the approval of the Engineer.

31. ELEVATOR SCHEDULE AND REQUIREMENTS

The Contractor shall conform to the following elevator schedules and requirements: for the elevators in the North tower (Tower A), the South tower (Tower B) and below the Plaza, west of Greenwich Street including the PATH under-pass:

NORTH TOWER BUILDING
ZONE I - LOCAL ELEVATORS

	Bank A	Bank B	Bank C	Bank D
Elevator No.	24-29 incl.	30-35 incl.	36-41 incl.	42-47 incl.
Elevator Use	Passenger	Passenger	Passenger	Passenger
Contract Load	3500 Lbs.	3500 Lbs.	3500 Lbs.	3500 Lbs.
Contract Speed	800 fpm	1000 fpm	1200 fpm	1400 fpm
Travel				
	Elev. #25-28	Elev. #31-34	Elev. #37-40	Elev. #43-46
	Concourse, 9-16	Concourse, 17-24	Concourse, 24-32	Concourse, 32-40
	Elev. #24&29 Service, Concourse, 9-16	Elev. #30 & 35 Service, Concourse, 17-24	Elev. #36 & 41 Service, Concourse, 24-32	Elev. #42 & 47 Service, Concourse, 32-40
Rise	Elev. #25-28 188 ft. ½in.	Elev. #31-34 284 ft. ½ in.	Elev. #37-40 380 ft. ½ in.	Elev. #43-46 476 ft. ½ in.
	Elev. #24 & 29 204 ft. ½ in.	Elev. #30 & 35 300 ft. ½ in.	Elev. #36 & 41 396 ft. ½ in.	Elev. #42 & 47 492 ft. ½ in.
Stops	Elev. #25-28 9	Elev. #31-34 9	Elev. #37-40 10	Elev. #43-46 10
	Elev. #24 & 29 10	Elev. #30 &35 10	Elev. #36 & 41 11	Elev. #42 & 47 11
Openings	Elev. #25-28 9	Elev. #31-34 9	Elev. #37-40 10	Elev. #43-46 10
	Elev. #24 & 29 10	Elev. #30 & 35 10	Elev. #36 & 41 11	Elev. #42 & 47 11
Platform Size	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep
Operation	Group Automatic	Group Automatic	Group Automatic	Group Automatic

NORTH TOWER BUILDING

	Bank A	Bank B	Bank C	Bank D
Control	Generator Field Control	Generator Field Control	Generator Field Control	Generator Field Control
Self-Leveling	Yes	Yes	Yes	Yes
Machine Type	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction
Safeties	Car and Counterweight	Car and Counterweight	Car and Counterweight	Car and Counterweight
Buffers	Oil	Oil	Oil	Oil
Lockdown Rope Compensation	Yes	Yes	Yes	Yes
Car & Hoistway Door Size	4 ft. 0 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high
Door Operation	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Speed Center Opening
Car Position Indicator	Yes	Yes	Yes	Yes
Hall Lanterns	At all floors	At all floors	At all floors	At all floors
Hall Call Indicators	In Starter's Panel	In Starter's Panel	In Starter's Panel	In Starter's Panel
Car Button Register Lights	Yes	Yes	Yes	Yes
Hall Button Register Lights	Yes	Yes	Yes	Yes
Supervisory Panel	Yes	Yes	Yes	Yes
Intercommunication System	Yes	Yes	Yes	Yes

NORTH TOWER BUILDING

ZONE II - LOCAL ELEVATORS

	Bank A	Bank B	Bank C	Bank D
Elevator No.	51 to 56	57 to 62	63 to 68	69 to 74
Elevator Use	Passenger	Passenger	Passenger	Passenger
Contract Load	3500 Lbs.	3500 Lbs.	3500 Lbs.	3500 Lbs.
Contract Speed	500 fpm	800 fpm	800 fpm	1000 fpm
Travel	Elev. No. 51, 52 Flrs. 44-54 Elev. No. 53-56 Flrs. 44,46-54	44, 55 to 61	Elev. No. 63,64,65 & 68 Flrs. 44, 61-67 Elev. No. 66 & 67 Flrs. 43,44,61-67	44, 61, 67 to 74
Rise	122 ft. 0 in. Elev. No. 51, 52 — 11	206 ft. 0 in.	Elev. No. 63,64,65 & 68 — 278 ft. 0 in. Elev. No. 66 & 67 — 292 ft. 0 in.	366 ft. 0 in.
Stops	Elev. No. 53-56 — 10	8	Elev. No. 63,64,65 & 68 — 8 Elev. No. 66 & 67 — 9	10
Openings	Elev. No. 51, 52 — 11 Elev. No. 53-56 — 10	8	Elev. No. 63,64,65 & 68 — 8 Elev. No. 66 & 67 — 9	10
Platform Size	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep
Operation	Group Automatic	Group Automatic	Group Automatic	Group Automatic
Control	Generator Field Control	Generator Field Control	Generator Field Control	Generator Field Control
Self-Leveling	Yes	Yes	Yes	Yes

NORTH TOWER BUILDING

	Bank A	Bank B	Bank C	Bank D
Machine Type	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction
Safeties	Car and counterweight	Car and counterweight	Car and counterweight	Car and counterweight
Buffers	Oil	Oil	Oil	Oil
Rope Compensation	Yes	Yes Locked down type	Yes Locked down type	Yes Locked down type
Car & Hoistway Door Size	4 ft. 0 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high
Door Operation	High Speed Electric Type for Single Sp. Center Opening	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Speed Center Opening
Car Position Indicator	Yes	Yes	Yes	Yes
Hall Lanterns	At all floors	At all floors	At all floors	At all floors
Hall Call Indicators	In Starter's Panel	In Starter's Panel	In Starter's Panel	In Starter's Panel
Car Button Register Lights	Yes	Yes	Yes	Yes
Hall Button Register Lights	Yes	Yes	Yes	Yes
Supervisory Panel	Yes	Yes	Yes	Yes
Intercommunication System	Yes	Yes	Yes	Yes

ZONE III - LOCAL ELEVATORS

	Bank A	Bank B	Bank C	Bank D
Elevator No.	75 to 80	81 to 86	87 to 92	93 to 98
Elevator Use	Passenger	Passenger	Passenger	Passenger
Contract Load	3500 lbs.	3500 lbs.	3500 lbs.	3500 lbs.

NORTH TOWER BUILDING

	Bank A	Bank B	Bank C	Bank D
Contract Speed Travel	500 fpm Elevators No. 75,76,77 & 80 Flrs. 78,80-86 Elevators No. 78 & 79 Flrs. 77 to 86	800 fpm 78,87 to 93	800 fpm 78,94 to 100	1000 fpm 78,101 to 107
Rise	Elevators No. 75,76,77 & 80 98 ft. 0 in. Elevators No. 78 & 79 110 ft. 0 in.	182 ft. 0 in.	266 ft. 0 in.	354 ft. 4 in.
Stops	Elevators No. 75,76,77 & 80 8 Elevators No. 78 & 79 10	8	8	8
Openings	Elevators No. 75,76,77 & 80 8 Elevators No. 78 & 79 10	8	8	8
Platform Size	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep
Operation	Group Automatic	Group Automatic	Group Automatic	Group Automatic
Control	Generator Field Control	Generator Field Control	Generator Field Control	Generator Field Control
Self-Leveling	Yes	Yes	Yes	Yes
Machine Type	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction
Safeties	Car and counterweight	Car and counterweight	Car and counterweight	Car and counterweight

NORTH TOWER BUILDING

	Bank A	Bank B	Bank C	Bank D
Buffers	Oil	Oil	Oil	Oil
Rope Compensation	Yes	Yes Locked Down type	Yes Locked down type	Yes Locked down type
Car & Hoistway Door Size	4ft. 0 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high
Door Operation	High Speed Electric Type for Single Sp. Center Opening	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Speed Center Opening
Car Position Indicator	Yes	Yes	Yes	Yes
Hall Lanterns	At all floors	At all floors	At all floors	At all floors
Hall Call Indicators	In Starter's Panel	In Starter's Panel	In Starter's Panel	In Starter's Panel
Car Button Register Lights	Yes	Yes	Yes	Yes
Hall Button Register Lights	Yes	Yes	Yes	Yes
Supervisory Panel	Yes	Yes	Yes	Yes
Intercommunication System	Yes	Yes	Yes	Yes

ZONE II - SHUTTLE ELEVATORS

	Elev. No. 1-4 & 8-11	Elev. No. 5	Elev. No. 6	Elev. No. 7
Elevator Use	Passenger	Passenger and Freight	Passenger, Freight and Restaurant	Passenger and Restaurant
Contract Load	10,000 lbs.	10,000 lbs.	10,000 lbs.	10,000 lbs.
Contract Speed	1600 fpm	1600 fpm	1600 fpm	1600 fpm

NORTH TOWER BUILDING

	Elev. No. 1-4 &8-11	Elev. No. 5	Elev. No. 6	Elev. No. 7
Travel and Opening Location*	Group Passenger Travel Concourse (S) Express to 44th Skylobby (N)	Group Passenger Travel Concourse (S) Express to 44th Skylobby (N)	Group Passenger Travel Concourse (S) Express to 44th Skylobby (N)	Group Passenger Travel Concourse (S) Express to 44th Skylobby (N)
Symbol Designation (N) North Opening (S) South Opening		Service Travel Service (N) Concourse (N) Plaza (N) 3rd-5th (N) 7th (N) 9th-40th (N) and 44th (N)	~~Restaurant~~ Service Travel Service (N) Concourse (N) 3rd-5th (N) Express to 44th(N) Express to 75th(N) 77th (N)-107th (N) Res't Passenger Tvl. Concourse (S) Express to 44 Skylobby (N) Express to 107th (S)	~~Restaurant~~ Service Travel Service (N) Concourse (N) Express to 44th (N) Express to 107th (N) Passenger Res't Passenger Tvl. Concourse (S) Express to 44th Skylobby (N) 67th (N) ** Express to 107 (S)
Rise	532 ft.-½ in.	548 ft.-½ in.	1322 ft. 4 in.	1322 ft. 4 in.
Stops	Group Passenger 2	Group Passenger 2 Service 40	Group Passenger 2 Restaurant Service 38 Restaurant 3	Group Passenger 2 Restaurant Service 4 Res't Passenger Tvl. 4
Total Openings	2	41	40	7
Operation	Automatic w/optional "Independent" operation	Automatic w/optional "Independent" operation	Automatic w/optional "Independent" operation	Automatic w/optional "Independent" operation

* See Contract Drawings for Symbol Designation

** P.A. Executive floor stop

NORTH TOWER BUILDING

	Elev. No. 1-4 & 8-11	Elev. No. 5	Elev. No. 6	Elev. No. 7
Platform Size	7ft. 3 in. wide by 13 ft. 3-1/2 in. deep	7 ft. 3 in. wide by 13 ft. 3-1/2 in. deep	7 ft. 3 in. wide by 13 ft. 3-1/2 in. deep	7 ft. 3 in. wide by 13 ft. 3-1/2 in. deep
Control	Generator Field Control	Generator Field Control	Generator Field Control	Generator Field Control
Machine Type	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction
Safeties	Car and counterweight	Car and counterweight	Car and counterweight	Car and counterweight
Buffers	Oil	Oil	Oil	Oil
Lockdown Rope Compensation	Yes	Yes	Yes	Yes
Car & Hoistway Door Size	5 ft. 2in. wide by 7 ft. 6 in. high (front & rear)	5 ft. 2 in. wide by 7 ft. 6 in. high (front & rear)	5 ft. 2 in. wide by 7 ft. 6 in. high (front & rear)	5 ft. 2 in. wide by 7 ft. 6 in. high (front & rear)
Door Operation	High Speed Electric Type for Dual Speed Center Opening	High Speed Electric Type for Dual Speed Center Opening	High Speed Electric Type for Dual Speed Center Opening	High Speed Electric Type for Dual Speed Center Opening
Car Progress Indicators in Car	Yes	Yes	Yes	Yes
Car Position Indicators in Central Control Panel	Yes	Yes	Yes	Yes
Intercommunication System	Yes	Yes	Yes	Yes
Hall Lanterns	At all Openings	Yes	Yes	Yes

ZONE III - SHUTTLE ELEVATORS

	Elevators No. 12 to 15 and 20 to 23	Elevators No. 16, 18 & 19	Elevator No. 17
Elevator Use	Passenger	Passenger and Interzone Service	Passenger, Freight Service and Interzone Service

NORTH TOWER BUILDING

	Elevators No. 12 to 15 and 20 to 23	Elevators No. 16, 18 & 19	Elevator No. 17
Contract Load	10,000 lbs.	10,000 lbs.	10,000 lbs.
Contract Speed	1600 fpm	1600 fpm	1600 fpm
Travel & Opening Location*	Group Passenger Service Concourse (N) Express to 78th Skylobby (S)	Group Passenger Service Concourse (N) Express to 78th Skylobby (S) Interzone Service ** Concourse (N) 44th Skylobby (N) 78th Skylobby (S)	Group Passenger Service Concourse (N) Express to 78th Skylobby (S) Service Operation Service (S) Concourse (S) Express to 41st (S) 43rd - 74th (S) & 78th Skylobby (S) Interzone Service ** Concourse (N) 44th Skylobby (N) 78th Skylobby (S)
Rise	952 ft. ½ in.	952 ft. ½ in.	968 ft. ½ in.
Stops	Group Passenger Service 2	Group Passenger Service 2 Interzone Service 3	Group Passenger Service 2 Service Operation 36 Interzone Service 3
Total Openings	2	3	38
Control	Generator Field Control	Generator Field Control	Generator Field Control
Platform Size	7 ft. 3 in. wide by 13 ft. 3-1/2 in deep	7 ft. 3 in. wide by 13 ft 3-1/2 in. deep	7 ft. 3 in. wide by 13 ft. 3-1/2 in. deep
Operation	Automatic with optional "Independent" Operation	Automatic with Optional "Independent" Operation	Automatic with Optional "Independent" Operation

* See Contract Drawings for Symbol Designation.
** See specifications for various Interzone Service Arrangements

NORTH TOWER BUILDING

	Elevators No. 12 to 15 and 20 to 23	Elevators No. 16, 18 & 19	Elevator No. 17
Machine Type	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction
Safeties	Car and counter-weight	Car and counter-weight	Car and counter-weight
Buffers	Oil	Oil	Oil
Lockdown Rope Compensation	Yes	Yes	Yes
Car & Hoistway Door Size	5 ft. 2 in. wide by 7 ft. 6 in. high (front and rear)	5 ft. 2 in. wide by 7 ft. 6 in. high (front and rear)	5 ft. 2 in. wide by 7 ft. 6 in. high (front and rear)
Door Operation	High Speed Electric Type for Dual Speed Center Opening	High Speed Electric Type for Dual Speed Center Opening	High Speed Electric Type for Dual Speed Center Opening
Car Progress Indicators in Car	Yes	Yes	Yes
Car Position Indicators in Central Control Panel	Yes	Yes	Yes
Intercommunication System	Yes	Yes	Yes
Hall Lanterns	At all openings	Yes	Yes

FREIGHT ELEVATORS

	Elevator No. 48	Elevator No. 49	Elevator No. 50	Elevator No. 99
Contract Load	5000 lbs.	5000 lbs.	6000 lbs.	4000 lbs.
Contract Speed	800 fpm	1000 fpm	1200 fpm	100 fpm
Travel	Service, Concourse, Plaza, 3rd to 7th, 9th to 40th	Service, Concourse, Express to 41st 42nd-74th	SB5, SB3, SB2, SB, Service, Concourse, Plaza, 3rd to 7th, 9th to 108th	107th (S), 106th (S) 108th (S) 109th (N) & 110th (N)

NORTH TOWER BUILDING

	Elevator No. 48	Elevator No. 49	Elevator No. 50	Elevator No. 99
Rise	492 ft. 0 in.	914 ft. 0 in.	1390 ft. 6 in.	57 ft. 4 in.
Stops	40	36	112	5
Openings	40	36	112	5
Platform Size	7 ft. 3 in. wide by 6 ft. 7 in. deep	7 ft. 11 in. wide by 7 ft. 0 in. deep	8 ft. 0 in. wide by 8 ft. 3 in. deep	5 ft. 11 in. wide by 8 ft. 10-1/2 in. deep
Operation	Single Car Collective w/Attendant	Single Car Collective w/Attendant	Single Car Collective W/Attendant	Single Car Collective w/Attendant
Control	Generator Field Control	Generator Field Control	Generator Field Control	Generator Field Control
Self-Leveling	Yes	Yes	Yes	Yes
Machine Type	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Geared Traction Located at 110th Fl. Level
Safeties	Car and counterweight	Car and counterweight	Car Safety	(Underslung type) Car and counterweight Safety
Buffers	Oil	Oil	Oil	Spring
Lockdown Rope Compensation	Yes	Yes	Yes	No
Car & Hoistway Door Size	4 ft. 6 in. wide by 7 ft. 6 in. high	4 ft. 6 in. wide by 7 ft. 6 in. high	4 ft. 6 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high
Door Operation	High Speed Electric Type for Dual Speed Side Opening	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Dual Speed Side Opening
Car Position Indicators	Yes	Yes	Yes	Yes

NORTH TOWER BUILDING

	Elevator No. 48	Elevator No. 49	Elevator No. 50	Elevator No. 99
Light Annunciators	Yes	Yes	Yes	Yes
Hall Button Register Lights	Yes	Yes	Yes	No
Intercommunication System	Yes	Yes	Yes	Yes

SOUTH TOWER BUILDING

ZONE I - LOCAL ELEVATORS

	Bank A	Bank B	Bank C	Bank D
Elevator No.	24-29 incl.	30-35 incl.	36-41 incl.	42-47 incl.
Elevator Use	Passenger	Passenger	Passenger	Passenger
Contract Load	3500 Lbs.	3500 Lbs.	3500 Lbs.	3500 Lbs.
Contract Speed	800 fpm	1000 fpm	1200 fpm	1400 fpm
Travel				
	Elev. 24, 25, 28 & 29 Concourse, 9-16	Elev. 30, 31, 34 & 35 Concourse, 17-24	Elev. #37-40 Concourse, 25-32	Elev. #43-46 Concourse, 33-40
	Elev. #26 & 27 Service, Concourse, 9-16	Elev. #32 & 33 Service, Concourse, 17-24	Elev. #36 & 41 Service, Concourse, 25-32	Elev. #42 & 47 Service, Concourse, 33-40
Rise	Elev. #24, 25 28 & 29 188 ft. ½ in.	Elev. #30,31 34 & 35 284 ft. ½ in.	Elev. #37-40 380 ft. ½ in.	Elev. #43-46 476 ft. ½ in.
	Elev. 26 & 27 204 ft. ½ in.	Elev. #32 & 33 300 ft. ½ in.	Elev. #36 & 41 396 ft. ½ in.	Elev. #42 & 47 492 ft. ½ in.
Stops	Elev. #24, 25, 28 & 29 9	Elev. #30, 31 34 & 35 9	Elev. #37-40 9	Elev. #43-46 9
	Elev. #26 & 27 10	Elev. #32 & 33 10	Elev. #36 & 41 10	Elev. #42 & 47 10
Openings	Elev. #24, 25, 28 & 29 9	Elev. #30, 31, 34 & 35 9	Elev. #37-40 9	Elev. #43-46 9
	Elev. #26 & 27 10	Elev. #32 & 33 10	Elev. #36 & 41 10	Elev. #42 & 47 10
Platform Size	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep
Operation	Group Automatic	Group Automatic	Group Automatic	Group Automatic
Control	Generator Field Control	Generator Field Control	Generator Field Control	Generator Field Control
Self-Leveling	Yes	Yes	Yes	Yes
Machine Type	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction

SOUTH TOWER BUILDING

	Bank A	Bank B	Bank C	Bank D
Safeties	Car and counter-weight	Car and counter-weight	Car and counter-weight	Car and counter-weight
Buffers	Oil	Oil	Oil	Oil
Lockdown Rope Compensation	Yes	Yes	Yes	Yes
Car & Hoistway Door Size	4 ft. 0 in. wide by 7ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high
Door Operation	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Speed Center Opening
Car Position Indicator	Yes	Yes	Yes	Yes
Hall Lanterns	At all floors	At all floors	At all floors	At all floors
Hall call Indicators	In Starter's Panel	In Starter's Panel	In Starter's Panel	In Starter's Panel
Car Button Register Lights	Yes	Yes	Yes	Yes
Hall Button Register Lights	Yes	Yes	Yes	Yes
Supervisory Panel	Yes	Yes	Yes	Yes
Intercommunica-tion System	Yes	Yes	Yes	Yes

SOUTH TOWER BUILDING

ZONE II - LOCAL ELEVATORS

	Bank A	Bank B	Bank C	Bank D
Elevator No.	51 to 56	57 to 62	63 to 68	69 to 74
Elevator Use	Passenger	Passenger	Passenger	Passenger
Contract Load	3500 Lbs.	3500 Lbs.	3500 Lbs.	3500 Lbs.
Contract Speed	500 fpm	800 fpm	800 fpm	1000 fpm
Travel	Elev. No. 51,52 Flrs. 44-54 Elev. No. 53-56 Flrs. 44, 46-54	44, 55 to 61	Elev. No. 63,64,65 & 68 Flrs. 44,62-67 Elev. No. 66 & 67 Flrs.43,44,62-67	44, 68 to 74
Rise	122 ft. 0 in.	206 ft. 0 in.	Elev. No. 63,64,65 & 68 278 ft. 0 in. Elev. No. 66 & 67 290 ft. 0 in.	362 ft. 0 in.
Stops	Elev. No. 51, 52 11 Elev. No. 53-56 10	8	Elev. No. 63,64,65 & 68 7 Elev. No. 66 & 67 8	8
Openings	Elev. No. 51, 52 11 Elev. No. 53-56 10	8	Elev. No. 63,64,65 & 68 7 Elev. No. 66 & 67 8	8
Platform Size	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep
Operation	Group Automatic	Group Automatic	Group Automatic	Group Automatic
Control	Generator Field Control	Generator Field Control	Generator Field Control	Generator Field Control
Self-Leveling	Yes	Yes	Yes	Yes

SOUTH TOWER BUILDING

	Bank A	Bank B	Bank C	Bank D
Machine Type	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction
Safeties	Car and Counterweight	Car and Counterweight	Car and Counterweight	Car and Counterweight
Buffers	Oil	Oil	Oil	Oil
Rope Compensation	Yes	Yes Locked down type	Yes Locked down type	Yes Locked down type
Car & Hoistway Door Size	4 ft. 0 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high
Door Operation	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Spee Center Opening
Car Position Indicator	Yes	Yes	Yes	Yes
Hall Lanterns	At all floors	At all floors	At all floors	At all floors
Hall Call Indicators	In Starter's Panel	In Starter's Panel	In Starter's Panel	In Starter's Panel
Car Button Register Lights	Yes	Yes	Yes	Yes
Hall Button Register lights	Yes	Yes	Yes	Yes
Supervisory Panel	Yes	Yes	Yes	Yes
Intercommunication system	Yes	Yes	Yes	Yes

SOUTH TOWER BUILDING

ZONE III - LOCAL ELEVATORS

	Bank A	Bank B	Bank C	Bank D
Elevator No.	75 to 80	81 to 86	87 to 92	93 to 98
Elevator Use	Passenger	Passenger	Passenger	Passenger
Contract Load	3500 Lbs.	3500 Lbs.	3500 Lbs.	3500 Lbs.
Contract Speed	500 fpm	800 fpm	800 fpm	1000 fpm
Travel	Elevators No. 75,76,77 & 80 Flrs. 78, 80-86 Elevators No. 78 & 79 Flrs. 77 to 86	78,87 to 93	78, 94 to 100	78, 101 to 107
Rise	Elevators No. 75,76, 77 & 80 98 ft. 0 in. Elevators No. 78 & 79 110 ft. 0 in.	182 ft. 0 in.	266 ft. 0 in.	354 ft. 4 in.
Stops	Elevators No. 75,76,77 & 80 8 Elevators No. 78 & 79 10	8	8	8
Openings	Elevators No. 75,76,77 & 80 8 Elevators No. 78 & 79 10	8	8	8
Platform Size	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep	8 ft. 1-1/2 in. wide by 5 ft. 7 in. deep
Operation	Group Automatic	Group Automatic	Group Automatic	Group Automatic
Control	Generator Field Control	Generator Field Control	Generator Field Control	Generator Field Control

SOUTH TOWER BUILDING

	Bank A	Bank B	Bank C	Bank D
Self-Leveling	Yes	Yes	Yes	Yes
Machine Type	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction
Safeties	Car and Counterweight	Car and Counterweight	Car and Counterweight	Car and Counterweight
Buffers	Oil	Oil	Oil	Oil
Rope Compensation	Yes	Yes Locked down type	Yes Locked down type	Yes Locked down type
Car & Hoistway Door Size	4 ft. 0 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high
Door Operation	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Speed Center Opening
Car Position Indicator	Yes	Yes	Yes	Yes
Hall Lanterns	At all floors	At all floors	At all floors	At all floors
Hall Call	In Starter's Panel	In Starter's Panel	In Starter's Panel	In Starter's Panel
Car Button Register Lights	Yes	Yes	Yes	Yes
Hall Button Register Lights	Yes	Yes	Yes	Yes
Supervisory Panel	Yes	Yes	Yes	Yes
Intercommunication System	Yes	Yes	Yes	Yes

SOUTH TOWER BUILDING

ZONE II - SHUTTLE ELEVATORS

	Elev. No. 1-4 & 8-11	Elev. No. 5	Elev. No. 6	Elev. No. 7
Elevator Use	Passenger	Passenger and Freight	Passenger, Freight and Observation	Passenger and Observation
Contract Load	10,000 Lbs.	10,000 Lbs.	10,000 Lbs.	10,000 lbs.
Contract speed	1600 fpm	1600 fpm	1600 fpm	1600 fpm
Travel and Opening Location*	Group Passenger Travel	Group Passenger Travel	Group Passenger Travel	Group Passenger Travel
	Concourse (E) Express to 44th Skylobby (W)	Concourse (E) Express to 44th Skylobby (W)	Concourse (E) Express to 44th Skylobby (W)	Concourse (E) Express to 44th Skylobby (W)
Symbol Designation		Service Travel	Service Travel	~~Observation~~ Service Travel
(E) East Opening (W) West Opening		Service (W) Concourse (W) Plaza (W) 3rd-5th (W) 7th (W) 9th-40th (W) and 44th (W)	Service (W) Concourse (W) Plaza (W) 3rd-5th (W) Express to 44th (W), Express to 75th (W), 77th (W)-107th (W) Observation Tvl Plaza (W) Express to 107th (E)	Service (W) Concourse (W) Plaza (W) Express to 44th (W) Express to 107th (W) Observation Passenger Tvl Plaza (W) Express to 107th (E)

* See Contract Drawings for Symbol Designation.

SOUTH TOWER BUILDING

	Elev. No. 1-4 & 8-11	Elev. No. 5	Elev. No. 6	Elev. No. 7
Rise	530 ft. ½ in.	546 ft. ½ in.	1316 ft. 4 in.	1316 ft. 4 in.
Stops	Grp. Passenger 2	Grp. Passenger 2	Grp. Passenger 2	Grp. Passenger 2
		Service 40	Service 39	Service 5
			Observation 2	Observation 2
Total Openings	2	41	41	7
Platform Size	7 ft. 3 in. wide by 13 ft. 3-1/2 in. deep	7 ft. 3 in. wide by 13 ft. 3-1/2 in. deep	7 ft. 3 in. wide by 13 ft. 3-1/2 in. deep	7 ft. 3 in. wide by 13 ft. 3-1/2 in. deep
Operation	Automatic w/optional "Independent" operation	Automatic w/optional "Independent" operation	Automatic w/optional "Independent" operation	Automatic w/optional "Independent" operation
Control	Generator Field Control	Generator Field Control	Generator Field Control	Generator Field Control
Machine Type	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction
Safeties	Car and Counterweight	Car and Counterweight	Car and Counterweight	Car and Counterweight
Buffers	Oil	Oil	Oil	Oil
Lockdown Rope Compensation	Yes	Yes	Yes	Yes

SOUTH TOWER BUILDING

	Elev. No. 1-4 & 8-11	Elev. No. 5	Elev. No. 6	Elev. No. 7
Car & Hoistway Door Size	5 ft. 2 in. wide by 7 ft. 6 in. high (front & rear)	5 ft. 2 in. wide by 7 ft. 6 in. high (front & rear)	5 ft. 2 in. wide by 7 ft. 6 in. high (front & rear)	5 ft. 2 in. wide by 7 ft. 6 in. high (front & rear)
Door Operation	High Speed Electric Type for Dual Speed Center Opening	High Speed Electric Type for Dual Speed Center Opening	High Speed Electric Type for Dual Speed Center Opening	High Speed Electric Type for Dual Speed Center Opening
Car Progress Indicators in Car	Yes	Yes	Yes	Yes
Car Position Indicators in Central Control Panel	Yes	Yes	Yes	Yes
Intercommunication System	Yes	Yes	Yes	Yes
Hall Lanterns	At all openings	Yes	Yes	Yes

SOUTH TOWER BUILDING
ZONE III - SHUTTLE ELEVATORS

	Elevators No. 12 to 15 and 20 to 23	Elevators No. 16, 18 & 19	Elevator No. 17
Elevator Use	Passenger	Passenger and Interzone Service	Passenger, Freight Service and Interzone Service
Contract Load	10,000 Lbs.	10,000 Lbs.	10,000 Lbs.
Contract Speed	1600 *fpm*	1600 *fpm*	1600 *fpm*
Travel & Opening Location*	Group Passenger Service Concourse (W) Express to 78th Skylobby (E)	Group Passenger Service Concourse (W) Express to 78th Skylobby (E) *Interzone Service* ** Concourse (W) 44th Skylobby (W) 78th Skylobby (E)	Group Passenger Service Concourse (W) Express to 78th Skylobby (E) *Service Operation* Service (E) Concourse (E), 3, 4, 5 Express to 41 (E) 43rd-74th (E) & 78th Skylobby (E) Interzone Service ** Concourse (W) 44th Skylobby (W) 78th Skylobby (E)
Rise	946 ft. ½ in.	946 ft. ½ in.	962 ft. ½ in.
Stops	Group Passenger Service 2	Group Passenger Service 2 Interzone Service 3	Group Passenger Service 2 Service Operation 36 Interzone Service 3
Total Openings	2	3	38

* See Contract Drawings for Symbol Designation.
** See Specification for various interzone service arrangements

SOUTH TOWER BUILDING

	Elevators No. 12 to 15 and 20 to 23	Elevators No. 16, 18 & 19	Elevator No. 17
Platform Size	7 ft. 3 in. wide by 13 ft. 3-1/2 in deep	7 ft. 3 in. wide by 13 ft. 3-1/2 in. deep	7 ft. 3 in. wide by 13 ft. 3-1/2 in. deep
Operation	Automatic with Optional "Independent" Operation	Automatic with Optional "Independent" Operation	Automatic with Optional "Independent" Operation
Machine Type	Gearless Double Wrap Traction	Gearless Double Wrap traction	Gearless Double Wrap Traction
Safeties	Car and Counterweight	Car and Counterweight	Car and Counterweight
Buffers	Oil	Oil	Oil
Lockdown Rope Compensation	Yes	Yes	Yes
Car & Hoistway Door Size	5 ft. 2 in. wide by 7 ft. 6 in. high (front and rear)	5 ft. 2 in. wide by 7 ft. 6 in. high (front and rear)	5 ft. 2 in. wide by 7 ft. 6 in. high (front and rear)
Door Operation	High Speed Electric Type for Dual Speed Center Opening	High Speed Electric Type for Dual Speed Center Opening	High Speed Electric Type for Dual Speed Center Opening
Car Progress Indicators in Car	Yes	Yes	Yes
Car Position Indicators in Central Control Panel	Yes	Yes	Yes
Intercommunication System	Yes	Yes	Yes
High Lanterns	At all openings	Yes	Yes
Control	Generator Field Control	Generator Field Control	Generator Field Control

SOUTH TOWER BUILDING

FREIGHT ELEVATORS

	Elevator No. 48	Elevator No. 49	Elevator No. 50	Elevator No. 99
Contract Load	5000 Lbs.	5000 Lbs.	6000 Lbs.	4000 Lbs.
Contract Speed	800 fpm	1000 fpm	1200 fpm	100 fpm
Travel	Service, Concourse, Plaza, 3rd to 7th, 9th to 40th	Service, Concourse, 3,4,5/ ~~Express to~~ 41st, 42nd-74th	SB3, SB2, SB, Service, Concourse, Plaza, 3rd-7th, 9th-108th	107th (E) 108th (E) 109th (W) and 110th (W), 106th (E)
Rise	492 ft. 0 in.	908 ft. 0 in.	1362 ft. 6 in.	57 ft. 4 in.
Stops	40	36	111	5
Openings	40	36	111	5
Platform Size	7 ft. 3 in. wide by 6 ft. 7 in. deep	7 ft. 11 in. wide by 7 ft. 0 in. deep	8 ft. 0 in. wide by 8 ft. 3 in. deep	5 ft. 11 in. wide by 8 ft. 10-1/2 in. deep
Operation	Single Car Collective w/Attendant	Single Car Collective w/attendant	Single Car Collective w/Attendant	Single Car Collective w/Attendant
Control	Generator Field Control	Generator Field Control	Generator Field Control	Generator Field Control
Self-Leveling	Yes	Yes	Yes	Yes
Machine Type	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Gearless Double Wrap Traction	Geared Traction Located at 110th Floor Level

SOUTH TOWER BUILDING

	Elevator No. 48	Elevator No. 49	Elevator No. 50	Elevator No. 99
Safeties	Car and Counterweight	Car and Counterweight	Car Safety	(Underslung type) Car and Counterweight Safety
Buffers	Oil	Oil	Oil	Spring
Lockdown Rope Compensation	Yes	Yes	Yes	No
Car & Hoistway Door Size	4 ft. 6 in. wide by 7 ft. 6 in. high	4 ft. 6 in. wide by 7 ft. 6 in. high	4 ft. 6 in. wide by 7 ft. 6 in. high	4 ft. 0 in. wide by 7 ft. 6 in. high
Door Operation	High Speed Electric Type for Dual Speed Side Opening	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Dual Speed Side Opening
Car Position Indicators	Yes	Yes	Yes	Yes
Light Annunciators	Yes	Yes	Yes	Yes
Hall Button Register Lights	Yes	Yes	Yes	No
Intercommunication System	Yes	Yes	Yes	Yes

BELOW GRADE ELEVATORS
PASSENGER ELEVATORS

	Elevators J-1, J-2 & J-3	Elevators K-3, K-4 & K-5	Elevator P-1
Contract Load:	Elevator J-1 6000 lbs. Elevator J-2 & J-3 4000 lbs.	Elevator K-5 6000 lbs. Elevator K-3 & K-4 4000 lbs.	8000 lbs.
Contract Speed:	250 fpm	250 fpm	100 fpm
Travel:	S-B-5, S-B-4, S-B-3, S-B-2, S-B-1, Service and Concourse	S-B-5, S-B-4, S-B-3, S-B-2, S-B-1, Service and Concourse	PATH Platform, S-B-3, S-B-1, Service and Concourse
Rise:	68 ft. 0 in.	68 ft. 0 in.	61 ft. 0 in.
Stops:	7	7	5
Openings:	7	7	5
Platform Size:	Elevator J-1 9 ft. 0 in. wide by 7 ft. 4 in. deep Elevator J-2 & J-3 8 ft. 0 in. wide by 6 ft. 3/4 in. deep	Elevator K-5 9 ft. 0 in. wide by 7 ft. 4 in. deep Elevator K-3 & K-4 8 ft. 0 in. wide by 6 ft. 3/4 in. deep	8 ft. 0 in. wide by 10 ft. 6 in. deep
Operation :	Group Automatic	Group Automatic	Single Car Collective w/Attendant
Control:	Generator Field Control	Generator Field Control	Generator Field Control
Self-Leveling:	Yes	Yes	Yes
Machine Type:	Basement Geared Single Wrap Traction	Basement Geared Single Wrap Traction	Basement Geared Single Wrap Traction

BELOW GRADE ELEVATORS

Safeties:	Car	Car	Car
Buffers:	Oil	Oil	Spring
Car and Hoistway Door Size:	Elevator J-1 4 ft. 6 in. wide by 7 ft. 6 in. high	Elevator K-5 4 ft. 6 in. wide by 7 ft. 6 in. high	
Car and Hoistway Door Size:	Elevators J-2 & J-3 4 ft. 0 in. wide by 7 ft. 6 in. high	Elevators K-3 & K-4 4 ft. 0 in. wide by 7 ft. 6 in. high	5 ft. 0 in. wide by 7 ft. 6 in. high
Door Operation:	High Speed Electric Type for Single Speed Center Opening	High Speed Electric Type for Single Speed Center Opening	Medium Speed Electric Type for Dual Speed Side Opening
Car Position Indicator:	Yes	Yes	Yes
Hall Call Indicators:	In Starter's Panel	In Starter's Panel	None
Car Button Register Lights:	Yes	Yes	Yes
Hall Button Register Lights:	Yes	Yes	Yes
Hall Lanterns:	Yes	Yes	No
Supervisory Panel:	Yes	Yes	No
Intercommunication System:	Yes	Yes	Yes
Telephone Cabinet and Connections:	Yes	Yes	Yes

BELOW GRADE ELEVATORS

FREIGHT ELEVATORS

	Elevators J-4 & K-1	*Elevator K-2*
Contract Load:	6000 lbs.	4000 lbs.
Contract Speed:	150 fpm	200 fpm
Travel:	Service to Concourse	S-B-5, El. 257, El. 268 and El. 294
Rise:	20 ft. 0 in.	52 ft. 0 in.
Stops:	2	4
Openings:	2*	4**
Platform Size:	9 ft. 0 in. wide by 7 ft. 0 in.	8 ft. 0 in. wide by 6 ft. 2 in.
Operation:	Two-Stop Collective w/attendant	Single Car Collective w/attendant
Control:	Generator Field Control	Generator Field Control
Self-Leveling:	Yes	Yes
Machine Type:	Basement Geared Single Wrap Traction	Basement Geared Single Wrap Traction (Underslung Type)
Safeties:	Car and Counterweight	Car
Buffers:	Spring	Spring
Car & Hoistway Door Size:	4 ft. 6 in. wide by 7 ft. 6 in. high	4 ft. 6 in. wide by 7 ft. 6 in. high
Door Operation:	Medium Speed Electric Type for Single Speed Center Opening	Medium Speed Electric Type for Single Speed Center Opening
Car Position Indicator	No	Yes
Hall Lanterns:	No	No
Telephone Cabinet and Connections:	Yes	Yes
Intercommunication System:	Yes	Yes
Hall Button Register Lights:	No	Yes

* Elev. K-1 1(N) + 1(S) Opening
** Elev. K-2 2(N) + 2(S) Openings

32. ELEVATOR CAR ENCLOSURES *

If the Contractor is to furnish the elevator car enclosures as specified under the clause of the Form of Contract entitled "Allowances - Elevator Car Enclosures and Entrances", the Contractor shall furnish complete the elevator car enclosures of the sizes and designs shown on the Contract Drawings and Specifications to be submitted to the Contractor on or before January 1, 1968 by the Authority. Such elevator car enclosures shall include but not be limited to car enclosure walls and canopy properly reinforced, finished wall paneling, base, wall and ceiling trim, emergency exits, handrails, finished ceiling, entrance columns, entrance doors, ceiling exhaust ventilating system, indirect lighting, fluorescent bulb car fixture, material for face plates and cut outs, certificate frames, capacity plate, car identity plate, fascias, pads and hooks for freight and combination elevators.

Car door hanger, interlocks, exit contacts, door operators and car sills and platforms are not to be considered part of the elevator car enclosures and these items shall be furnished and installed and field coordinated by the Contractor whether or not the Authority elects to purchase the elevator car enclosures under a separate contract with others.

It is understood that if another contractor furnishes the elevator car enclosures he will construct them in such a manner that they will accommodate the Contractor's accessory equipment such as the door operators, door hangers and door interlocks.

33. ELEVATOR HOISTWAY ENTRANCES *

If the Contractor is to furnish and install the elevator hoistway entrances as specified under the clause of the Form of Contract entitled "Allowances - Elevator Car Enclosures and Entrances", the Contractor shall furnish and install complete the elevator hoistway entrances of the sizes and designs shown on the Contract Drawings and Specifications to be submitted to the Contractor on or before January 1, 1968 by the Authority. Such elevator hoistway entrances shall include but not be limited to sills, sill brackets, shims, toe guard, dust plates, door frame properly reinforce and anchored, door panels, struts, fascias, hanger support and covers, sight guards with approved floor numerals and hardware.

It is understood that if another contractor furnishes and installs the elevator hoistway entrances he will construct and install the entrances in such a manner that they will accommodate the Contractor's accessory equipment such as the door operators, door hangers and door interlocks.

* See Addendum No. 3, April 1, 1968 attached hereto in Book III

34. WORK BY OTHERS (ELEVATORS)

There will be furnished by others:

(1) Elevator hoistways and hoistway enclosures.

(2) Supports to carry loads for all equipment including machine beams, car and counterweight guides, buffers and lockdown devices, and other equipment required for the complete elevator installation.

(3) Concrete slabs, smoke and rope holes and required gratings constructed after the Contractor's machine beams are in place at elevator machine rooms, and including concrete slabs, smoke and rope holes and required gratings at secondary levels where required.

(4) All access doors and frames to elevator machine rooms, secondary levels, motor generator rooms, and pits where required. Sixty degree ladders to secondary levels; access ladders to pits, pit buffers; concrete steps, handrails, and guardrails at elevator machine room levels, secondary levels and pits as required.

(5) Elevator pits of required depth.

(6) All cutting, patching and chasing of walls, beams, and masonry, as required for the elevator installation, provided sufficient notice is given in advance by the Contractor to the Authority.

(7) Bent plate metal edge forms affixed to hoistway supporting frame at hoistway entrances to receive floor slab and hoistway entrance sill hardware where required.

(8) Grout under hoistway door sills

(9) Adequate heat, light and ventilation for machine rooms.

(10) A circuit at 120 volts will be brought to the shaft outlet box at midpoint in the hoistway of each elevator in the contract except shuttle elevators. Two circuits at 120 volts will be brought to the shaft outlet box at midpoint in the hoistway of shuttle elevators.

(11) A telephone instrument in all cars.

(12) A power supply of 480 volts, 3 phase, 60 cycles will be brought to the starting switches of the elevator controllers or motor generator starter panels for final connection by the Contractor. Main line switches and wiring from these switches to the starter switches will be provided. A separate 208 volt, 3 phase, 60 cycle power supply will be brought to each elevator machine room to provide a separate power source for elevator signals.

(13) Limited emergency power source will be available on main power supply feeders including a sensing circuit in each elevator machine room.

(14) A console or other mouting arrangements at one location in the Concourse Elevator Lobby of each Tower to receive the starter control panels.

(15) Steel plates for separator beams.

(16) Fireline sub-master stations in starters control panels and consoles. This contractor shall make provisions within panel design to accept these stations. (Approx. 12" x 20")

(17) Emergency doors in blind hoistway of Elevator nos. 5 & 49.

The Contractor at his own expense, shall furnish all Materials and construction required by the Contract Drawings and Specifications with the exception of that construction and those Materials expressly provided to be furnished to the Contractor in accordance with this clause.

35. ELEVATOR CODE REQUIREMENTS

All parts and appurtenances of the elevators shall conform in every way to the requirements of the Safety Code for Elevators, Dumbwaiters and Escalators as approved by the American Standards Associates A 17-1-1965,

including all revisions to date hereinafter referred to as ASA A17-1, the Proposed Elevator Code of the Department of Buildings of New York City, which is attached hereto and made a part of this Contract and which would be applicable if the Authority were a private corporation, and to all other codes and provisions which would relate to the installation if the Authority were a private corporation. Where the Contractor finds conflicts between cited codes and the provisions of the proposed elevator code of the Department of Buildings of New York City the provisions of the latter shall govern.

The Contractor shall bring to the attention of the Engineer conflicts between cited codes and the Specifications. The Engineer shall determine which provisions shall govern.

36. ELEVATOR MAINTENANCE

The Contractor shall furnish full maintenance on each local elevator, individual shuttle, freight or below grade elevator for a period of twelve (12) months after the Contractor has received a Certificate of Acceptance for 20 elevators in Zone I of the North Tower in accordance with the Agreement between the parties dated August 15, 1967 1967, entitled "Agreement to Perform Maintenance of Elevators and Escalators in North Tower Building, South Tower Building and Below Grade Levels of The World Trade Center", and at no cost to the Authority.

37. ELEVATOR GUARANTEE

The Contractor hereby unconditionally guarantees the Materials sold and the Work performed under this Contract against defects in Materials and workmanship and against failure to operate satisfactorily in accordance with the operational results called for in the Contract Drawings and Specifications in their present form for any reason whatsoever for a period of one year from the date of the rendition of the Certificate of Partial Completion applicable thereto, if any, or the Certificate of Final Completion of the Work whichever date is earlier, other than defects or failures shown by the Contractor to the satisfaction of the Engineer to have arisen solely from abuse or accidents not contributed to by the Contractor or from affirmative, willful acts of the Authority occurring after execution of this Contract. The Contractor shall immediately make such adjustments, replacements and/or repairs as are necessary or desirable to remedy any conditions covered by this guarantee without separate or additional compensation therefor.

38. LOGIC SYSTEM

The logic system shall be capable of providing quality of service which will produce the following elevator service:

A. Up-Peak Period

- Under normal up-peak operation, the average interval between Concourse or Skylobby departures for each local bank will be no more than 25 seconds during the peak five minutes.
- Under an intense-up operation, the average interval between Concourse or Skylobby departures for each zone of the local bank will be no more than 36 seconds during the peak five minutes. An exception will be granted in the cases of Bank 1B and 2D. In these cases the average interval between cars should not exceed 41 seconds. Transfer times (from doors 3/4 open ready to close) is assumed to be 17 seconds at the main floor and 26 seconds in total for all other stops combined.
- The average interval between Concourse departures for each shuttle bank (group of five or six cars each serving two local banks) will be no more than 30 seconds during the peak five minutes.

B. Mid-Day Period

- For every five minute period, the arithmetic average of passenger waiting times will be less than 20 seconds for each local bank.

C. Down-Peak Period - The average interval between Concouse or Sky-lobby arrivals for each local bank will be no more than 15 seconds (or 30 seconds per zone when two zones are used) during the peak five minutes.

- The average interval between Concourse arrivals for each shuttle bank (group of five or six cars each serving two local banks) will be no more than 30 seconds during the peak five minutes.
- Within each local bank, the average passenger waiting times for the floor receiving the poorest service will be no more than 150 percent of the average passenger waiting times for the entire bank during the peak five minutes.

NOTE: The number of passengers waiting in any local elevator lobby should not exceed 37. An exception may be permitted if an elevator bank's departure rate exceeds 80 passengers per minute (for three-minutes or more) during the down peak period or if a bank's arrival rate exceeds 55 passengers per minute (for three minutes or more) during an up peak period.

The Contractor's logic system shall be of the latest technology at the time of its installation. It shall provide a service which is satisfactory to the Authority. The Contractor shall include as many modules in his logic system as required to achieve the operational results provided for in the Specifications in their present form.

The anticipated passenger loads for the Towers are listed in the Authority's letters to the Contractor dated January 18, 1967 and March 31,1967 which are hereby made apart hereof. The Tower A traffic estimates provided

with our letter of January 18, 1967 are as noted herein, by their very nature subject to revision as changes in expected tenancy and variations in expected population and traffic patterns occur. Such anticipated passenger loads will be supplemented from time to time. However, the Authority makes no representation as to the accuracy of these projected passenger loads.

39. OPERATION OF ELEVATORS

A. Local Passenger Elevators

The following shall apply to all North and South Tower local elevators (except Elevator 99) and Elevators K-3, K-4, K-5, J-1, J-2 and J-3.

The operation of all elevators shall be arranged for group automatic operation as defined by the American Standard Safety Code for Elevators, ASA-A17.1 revised, controlled by a group supervisory control system.

All elevators shall be arranged for automatic signal control operation without attendant. The control of the elevators shall be automatic through the car buttons, through the landing buttons, or through dispatching means.

The starting of a car shall be contingent upon the establishing of the door interlock circuit. The cars shall automatically slow down and stop level at the floors in response to car or hall button calls and stops shall be made in sequence and irrespective of the order in which the car buttons or hall buttons are pressed. A hall call shall be automatically cancelled as the car slows down and while stopped to prevent other cars from responding to the same call.

A hall button call shall automatically stop the nearest car traveling in the corresponding direction or the next available car. An alarm button shall be connected to an alarm bell, located in the hoistway at the lobby floor.

The operation of the emergency stop switch in the car shall, in addition to stopping the car, cause a suitably located alarm bell under the car to ring and to continue ringing until the stop switch is retracted.

A switch shall be provided in the service cabinet in each elevator for selecting "Independent Service" operation to permit any one or more of the elevators to be removed from the group control and used for special service without interfering with the normal operation of the remainder of the group. When this switch is in the "Independent Service" position, the elevator shall be disconnected from the group supervisory control system, connected

for "Attendant Operation" with all hall calls being automatically bypassed and the highest call reversal circuits disconnected so that the attendant shall have full control over starting, stopping and direction or car travel from car buttons. The service cabinet shall be provided with a key operated lock.

A key operated switch shall be provided for each elevator in the starter's control panel for shutting down that elevator at the Concourse (Zone I elevators and Elevators K-3, K-4, K-5, J-1, J-2 and J-3), the 44th floor skylobby (Zone II elevators) and the 78th floor skylobby (Zone III elevators). When this switch is thrown to the "Out of Service" position, the Concourse Level doors (Zone I and Elevators K-3, K-4, K-5, J-1, J-2 and J-3) and skylobby doors (Zone II and III elevators) shall close and the motor generator shall shut down. When this switch is thrown to the "In Service" position, the motor generator shall start (providing switch in machine room is on) and the Concourse Level doors (Zone I elevators and Elevators k-3, k-4, k-5, J-1, J-2 and J-3) and skylobby doors (Zones II and III elevators) shall open.

Each car shall be provided with a combination mechanical and electrical load weighing device which, when the particular car is filled to an adjustable percentage of the capacity load, shall cause the car to bypass the landing calls but not car calls. These bypassed landing calls shall remain registered for the next following car. When a car is filled to the adjustable percentage of capacity at the lower main terminal this device shall cause the car to be dispatched without waiting for the elapse of the normal dispatching interval.

When a car is operating on the "Intermittent Program" the motor generator shall stop automatically, unless within a predetermined time the car is dispatched in response to calls.

Whenever a car is returned to automatic operation after being operated on "Independent Service" the car shall immediately take its place in the group.

The doors will be prevented from closing, or if closing may be reversed by a door reopening device on the car door or pressing the "Door Open" button in the car. The door opening times shall be adjustable so the "Open" time for a car call shall be shorter than the corresponding times for hall calls.

Whenever there is not an available car on the Concourse Level (Zone I elevators and Skylobby Level, Zones II and III elevators) in Banks B, C, and D, the next down traveling car shall, immediately upon entering the blind shaft, be selected and the lantern over the lower terminal floor door of that car shall be illuminated.

B. Shuttle Elevators

The control of the shuttle elevators shall be automatic through dispatching means.

The starting of a car shall be contingent upon the establishing of a door interlock circuit.

The operation of the emergency stop switch in the car shall, in addition to stopping the car, cause an alarm bell located underneath the platform to ring. Two car operating panels shall be provided, each containing an emergency stop switch and alarm bell button. "Door Open" button and floor buttons (openings served under group passenger, interzone, restaurant, or observation operation only) shall be provided in each shuttle elevator. The car buttons shall be of the call register type. One panel shall be mounted at each end of the elevator cars in a location as determined by the Engineer. When a call is registered in one panel, the corresponding button in the opposite panel shall also illuminate to indicate that the call has been registered.

An alarm button shall be connected to an alarm bell located in the elevator hoistway at Concourse Level.

A switch shall be provided for each elevator for selecting "Independent Service" operation to permit any one or more of the elevators to

be removed from the group dispatching control system. When this switch is in the "Independent Service" position, the elevator shall be disconnected from the group dispatching system and the "door close" buttons shall become operative. The following buttons and switches shall be placed behind a concealed panel:

(1) Independent service switch.

(2) Motor generator switch.

(3) Inspection operating switch.

(4) Other switches necessary for servicing.

(5) Readout devices to indicate openings served under Service Operation shall be provided for Elevators Nos. 5, 6, 7, and 17. Readouts shall be of the projection and instantaneous transfer type with characters 1 inch in height.

(6) A convience outlet, blower, and lightswitch.

(7) Car operating buttons corresponding to the floors served under Service with the corresponding up/down light annunciator indications, specified as part of the Service Operation, shall also be located in this panel. The annunciator indications shall be mounted in a vertical pattern adjacent to the car buttons corresponding to the floor indications. The "special operation" car buttons, annunciator lights, etc. contained in this panel shall be normally concealed behind hinged doors, which when open shall return into the car operating box.

A key switch shall be provided for each elevator on the group control panel for shutting down the elevator at the Concourse Level. When this switch is thrown to the "Out of Service" position, the Concourse Level doors shall close and the motor generator shall shut down. When this switch is thrown to the "In Service" position, the motor generator shall start (providing switch in the machine room is on) and the Concourse Level doors shall open.

Each car shall be provided with a combination mechanical and electrical load weighing device which, when the particular car is filled to an

adjustable percentage of the capacity load, shall cause the car to be dispatched without waiting for the elapse of the normal dispatching interval.

Whenever a car is returned to automatic operation after being operated on "Independent Service" the car shall immediately take its place in the group.

Whenever there is not an available car at the Concourse or a Skylobby floor, the car nearest to the respective terminal (and within about six floors of the terminal) shall be selected and the lantern over the entrance door of that car shall be illuminated.

Should a car delay at a floor beyond a reasonable predetermined time, a light in the starter's panel shall flicker to call attention to the delay. In addition, an audible signal shall sound at the starter panel location.

C. FREIGHT ELEVATORS 48, 49, and 50

1. Automatic Control

The operation shall be selective-collective automatic control with a flush mounted operating device in the car which shall include a bank of buttons numbered to correspond to the landings served, a switch for the car light, an alarm button connected to a bell which serves as an emergency signal, an emergency stop switch, and "Up" and "Down" direction buttons. In addition, an Up-Down light annunciator shall be incorporated in the car operating panel arranged so that the numeral corresponding to the hall buttons will illuminate for the desired direction. The numerals shall be extinguished when the call has been answered. Single pushbuttons shall be mounted at each terminal landing and "Up" and "Down" buttons at each intermediate landing. Each hall pushbutton station shall be of the call register type. Each car button shall be of the call register type. Whenever a call is registered, the button shall illuminate and remain illuminated until the call is answered.

The operation shall be such that momentary pressure of one or more car or landing buttons, other than those for the landing at which the car is standing, shall start the car, provided the interlock circuits are established and cause the car to stop at the first landing for which a car or landing button is pressed corresponding to the direction in which the car is traveling. The car shall stop at all landings for which calls are registered and these stops shall be made in the order in which the landings are reached, irrespective of the sequence in which the buttons are pressed, provided the button for a given landing is pressed sufficiently in advance of the arrival of the car at that landing to permit the stop to be made.

If no car buttons are pressed and the car starts "Up" in response to several "Down" calls, the car shall proceed first to the highest "Down" call and then reverse to collect the other "Down" calls. "Up" calls shall be collected similarly when the car starts "Down" in response to such calls. If the car stops for a landing call and a car button is pressed within a predetermined interval after the stop for a landing corresponding to the direction the car was traveling, the car shall proceed in the same direction regardless of other landing calls registered.

If "Down" landing buttons are pressed while the car is traveling "Up", the car shall not stop at these landings, but these calls shall remain registered. After the highest car and landing calls have been answered and the door interlock circuit is established, the car shall reverse automatically and respond to "Down" car and landing calls. When traveling "Down", the car shall not respond to "Up" landing calls, but these calls shall remain registered and be answered on the next "Up" trip.

A "home landing" feature shall be provided which shall return the car to the Service Level when there are no car or hall calls registered.

An "Emergency Return" switch shall be mounted under a "break-glass" cover in an approved location adjacent to the Concourse Level opening of Elevator No. 50 and when operated shall cause Car No. 50 to bypass registered car and hall calls and return to the Concourse Level. In addition, the actuation of this switch shall arrange Elevator No. 50 to serve all its equipped openings i.e., all floors including SB5*, SB3, SB2, SB, Service, Concourse, Plaza, 3rd to 7th, 9th to 108th floors.

2. Control With Attendant

The operating panel in the car shall contain a two-position key operated switch marked to indicate "With Attendant" and "Without Attendant", "Up" and "Down" direction light jewels, a buzzer and non-stop button. The jewels and buttons shall be placed behind a locked cover, the doors of which shall be hinged and arranged to retract into the car return panel in the"Open" position.

With the key switch in the position of "With Attendant", the direction lights and buzzer shall be operative and the "Up" direction button and "Down" direction button in the car operating panel shall become effective for the attendant operating. The car and hoistway doors shall open automatically at each stop, but door closing shall be subject to the "Up" and "Down" direction buttons. As a visual signal to the attendant, the "Up" or "Down" direction jewel shall illuminate upon registration of either car or landing calls to indicate the travel direction of the car. The attendant shall operate the car normally

*Note: no stop in South Tower

in the direction indicated by the direction light jewel, but if desired, shall be able to realize opposite direction travel by pressure of a car button for a landing in that direction from the car and the direction button in the car operating panel for that direction. The buzzer shall sound on the pressure of a landing button if a hoistway door is open.

The pressing of a direction button shall cause the doors to close and start the car in the direction desired. If pressure of the direction button is released before the car starts, the doors shall re-open. After the car has started, the direction button may be released and the car shall answer the car and landing button calls.

Continuous pressure of the non-stop button shall cause the car to bypass all landing calls and respond only to registered car calls.

D. Elevators P-1, K-2, and Elevator No. 99 in each Tower

1. Automatic Control

The operation shall be selective-collective automatic control with a flush mounted operating device in the car which shall include a bank of buttons numbered to correspond to the landings served, an alarm button connected to a bell which serves as an emergency signal, and emergency stop switch, and "Up" and "Down" direction buttons. Signal push buttons shall be mounted at each terminal landing and "Up" and "Down" buttons at each intermediate landing. Each car push button shall be of the call register type arranged to illuminate when pressed. (except for Elev. No. 99 each No. 2) Whenever a landing call is registered, a jewel shall illuminate or the button shall illuminate corresponding to the direction of travel selected for Elevators P-1 and K-2. Direction jewels or buttons shall remain illuminated until the call is answered.

The operation shall be such that momentary pressure on one or more car or landing buttons, other than those for the landing at which the car is standing, shall start the car, provided the interlock circuits are estalished, and cause the car to stop at the first landing for which a car or landing button is pressed corresponding to the direction in which the car is traveling. The car shall stop at all landings for which calls are registered and these stops shall be made in the order in which the landings are reached, irrespective of the sequence in which the buttons are pressed, provided the button for a given landing is pressed sufficiently in advance of the arrival of the car at that landing to permit the stop to be made.

If no car buttons are pressed and the car starts "Up" in response to several "Down" calls, the car shall proceed first to the highest "Down" call and then reverse to collect the other "Down" calls. "Up" calls shall be collected similarly when the car starts "Down" in response to such calls. If the car stops for a landing call and a car button is pressed within a predetermined interval after the stop for a landing corresponding to the direction the car was traveling, the car shall proceed in the same direction regardless of other landing calls registered.

If "Down" landing buttons are pressed while the car is traveling "Up", the car shall not stop at these landings, but these calls shall remain registered. After the highest car and landing calls have been answered and the door interlock circuit is established, the car shall reverse automatically and respond to "Down" car and landing calls. When traveling "Down" the car shall not respond to "Up" landing calls, but these calls shall remain registered and be answered on the next "Up" trip.

All car and hall buttons of Elevator No. 99 in both towers shall be of key-operated type. An adjustable timing device shall be provided on the elevator, arranged to shut down the generator set after a period of approximately 20 seconds after the last hall or car hall has been registered. Upon the registration of a car or hall call the motor generator set shall automatically start.

2. Control With Attendant

The operating panel in the car shall contain a two-position key operated switch marked to indicate "With Attendant" and "Without Attendant", "Up" and "Down" direction light jewels, a buzzer and a nonstop button. The jewels, buttons, car light switch, key-operated motor generator switch, pilot light and 110 volt receptacle shall be placed behind a locked cover, the doors of which shall be hinged and arranged to retract into the car return panel in the "Open" position. An "Up-Down" light annunciator (automatic reset type) shall be provided in the car operating panel of Elevator No.99 behind the hinged doors. The annunciator will operate when the elevator is on "With Attendant" operation.

With the key switch in the position of "With Attendant", the

direction lights and buzzer shall be operative and the "Up" direction button and "Down" direction button in the car operating panel shall become effective for the attendant operation. The car and hoistway doors shall open automatically at each stop, but door closing shall be subject to the "Up and "Down" direction buttons. As a visual signal to the attendant, the "Up" or "Down" direction jewel shall illuminate upon registration of either car or landing calls to indicate the travel direction of the car. The attendant shall operate the car normally in the direction indicated by the direction light jewel, but if desired, shall be able to realize opposite direction travel by pressure on a car button for a landing in that direction from the car and the direction button in the car operating panel for that direction. The buzzer shall sound on the pressure of a landing button if a hoistway door is open.

The pressure on a direction button shall cause the doors to close and start a car in the direction desired. If pressure on the direction button is released before the car starts, the doors shall reopen. After the car has started, the direction button may be released and the car shall answer car and landing button calls.

Continuous pressure on the nonstop button shall cause the car to bypass all landing calls and respond only to registered car calls.

E. Elevators J-4 and K-1

The operation shall be two-stop collective control with a flush mounted operating device in the car which shall include two push buttons marked to correspond with the landings served, an emergency stop switch, alarm button connected to a bell which serves as an emergency signal, "Door Open" button and "Up" and "Down" direction buttons. A single push button shall be included at each landing.

The operation shall be such that the car cannot be started unless the car door is in the closed position and the hoistway doors are locked in the closed position. When the key switch is in the position "Without Attendant" and the car is standing at either terminal, pressure on a car button for the opposite terminal shall dispatch the car to that terminal. Pressure on a landing button at the terminal opposite from where the car is standing shall call the car to that terminal. The car and the hoistway doors shall open automatically when the car stops at a landing and close either after expiration of a time interval or the moment the car button for the opposite terminal is pressed. Momentary pressure on the landing button at the terminal where the car is standing shall automatically open the car and hoistway doors and they shall remain open for the interval set or until the car button for the other terminal is pressed.

Control "With Attendant"

The operating panel in the car shall contain a two position key-operated switch marked to indicate "With Attendant" and "Without Attendant" and a buzzer. A light switch, key-operated motor generator switch, a pilot light and 110 volt receptacle shall be placed behind a locked cover, the doors of which shall be hinged and arranged to retract into the car operating panel when in the open position. When the key switch is in the position "With Attendant" a buzzer on the car shall sound whenever a landing button is pressed, and closing of the car and hoistway doors shall be subject to the "Up" and "Down" direction buttons in the car operating panel. When the car door and hoistway door are closed by continuous pressure on the proper direction button after a call from the opposite terminal the car shall proceed to that terminal. Movement of the car to the opposite terminal, without a call from that terminal, shall be obtained by momentarily pressing a car button for that terminal and pressing a direction button until the car and hoistway doors are closed. It shall be possible to release pressure on the direction button after the car has started. If released sooner, the car and hoistway doors shall reopen.

F. Special Operations

Elevators in Zone II and III; Elevators 51 and 52 and Elevators 78 and 79, shall be arranged to serve the 45th floor and the 79th floor respectively during "Off Peak" period as determined by the Tork Clock and which can be overridden by a separate key switch located in each starter's control panel for the respective bank of elevators.

A limited service will be provided at these floors, which will only provide an "Up" corridor button on the floor, and the cars shall be arranged to respond to car buttons for these floors when cars are travelling in the "Down" direction only.

Elevators No. 66 and 67 in Zone II and Elevators No. 78 and 79 in Zone III shall be arranged to serve the floors below their respective Skylobbies. The car buttons for these floors, the "Down" hall buttons at the Skylobby floor and the "Up" buttons at the floors below the Skylobbies shall be of the key-operated type. This "Lower Floor Service" shall be provided at the Skylobbies shall be of the key-operated type. This "Lower Floor Service" shall be provided at the Skylobby floor upon registration of a down landing call at the Skylobby floor, a "Lower Floor" car call or a hall call at the "Lower Floor." The cars returning from the "Lower Floor" with car buttons registered to landings above shall not remain at the Skylobby floor more than the normal time interval for intermediate stops, providing there are one or more other cars in the group at this landing waiting to be dispatched.

A separate key switch shall be provided for each of Shuttle Elevators No. 5, 6 and 17 which when in the "on" position shall affect these elevators as follows:

1. Shuttle Elevator No. 5 shall be disconnected from its group operation and shall be connected to the button riser of Elevator No. 48 at the floors where its openings are directly adjacent to those of Elevator No. 48. Similarly, when the service key switches for Shuttle Elevators No. 17 and 6 are actuated, the shuttle elevator corresponding to the key switch shall be disconnected from the group operation and shall be connected to the opposite freight car (i.e. Elevator No. 17 shall be connected to

Service Elevator No. 49), where the shuttle elevator openings occur opposite to the service elevator openings. Under the special "Service Operation" all shuttle elevators shall serve the openings listed in the "Elevator Opening Schedule" under "Service Operation" in the opening schedule contained in these Specifications.

Operation No. 1

Under this arrangement, the shuttle elevator and service elevator shall operate under "Independent Operation" in response to registered car button calls. The hall button riser shall be connected to Up-Down automatic reset light annunciator indications which shall be provided in both the service elevator and shuttle elevators. The annunciator indications shall be cross-connected so that when either car responds to an annunciator call, the indication corresponding to this call will be cancelled in each elevator. When more than one opening exists on the shuttle elevator at a particular floor, only the designated opening to be served under "Service Operation", as listed under the "Elevator Opening Schedule" in these Specifications, shall open when the elevator arrives at the floor.

Operation No. 2

Under this arrangement, the shuttle elevator shall operate under "Independent Operation" in response to registered car button calls and the service elevator shall operate as an automatic elevator either with or without attendant from its normal hall button riser at the scheduled service openings only. This hall button riser shall be cross-connected to the light annunciator indications in the corresponding shuttle elevator so that when either elevator responds to a hall call demand

(or annunciator call demand), the hall call demand will be cancelled (or the annunciator light extinguished). When the service elevator is on "With Attendant" operation its light annunciator indications shall be operative for informational purposes. When the service elevator is operating on "Without Attendant" operation, the annunciator lights shall be inoperative.

2. Where the "Elevator Schedule and Requirements" calls for service openings on a shuttle elevator which do not occur directly opposite or adjacent to a service elevator opening, an additional annunciator button shall be provided and connected to a light annunciator indicator in the respective shuttle elevator only.

The car and hall buttons for Elevators No. 24 and 29, (North Tower), 26 and 27 (South Tower), 30 and 35 (North Tower), 32 and 33 (South Tower), 36 and 41, (North and South Towers), and 42 and 47 (North and South Towers), at the service openings shall be connected to the Tork clock in such a manner as to provide service to and from this floor during "Off Peak" periods only. A key switch shall be provided in the control panel located in the starter's panel which when operated shall override the clock control and provide or cancel service to these floors at any time. Special miniature signs marked "No Service" shall be provided in the hall button fixtures at the Service Level, arranged to illuminate when the service to these floors is cancelled. When the elevators are providing service to the Service Level below, this service shall be provided at the Concourse Level upon the registration of a down landing call at this level, a service floor car call or a hall call at the Service Level floor. The cars returning from the service level floor with car buttons registered to landings above shall not remain at the Concourse Level more than the normal time interval for intermediate stops, providing there are one or more other cars in the group at this landing waiting to be dispatched.

A key operated switch shall be provided in the car operating panels of elevators no. 93 to 98 of Bank D, Zone III, South Tower only, which shall be mounted adjacent to the 107th floor car button when the switch is in

"A key operated switch shall be provided in the car operating panels of Elevators No. 93 to 98 of Bank D, Zone III, South Tower only, mounted adjacent to the 107th Floor car button. When the switch is in the "on" position, the normal registration of the 107th Floor button will be permitted. When the switch is in the "off" position, the 107th Floor car button shall be inoperative and a miniature sign shall illuminate the words "Not In Use". This sign shall be located adjacent to the 107th Floor car button. Similarly, a key switch shall be provided in the 107th Floor hall pushbutton fixture mounted directly below the hall button. When the switch is in the "on" position, normal registration of a hall call shall be permitted, and cars will travel to the 107th Floor on hall button demand. When the switch is in the "off" position, the 107th Floor hall button shall be inoperative and a miniature sign located in the hall button fixture shall illuminate the words "Not In Use". The car or cars will proceed to the 107th Floor upon keyed registration of the "Up" hall button at the 106th Floor and/or upon the registration of a 107th Floor car or hall button call. If a supervisory system is used which utilizes a top dispatching terminal, cars returning from the 107th Floor with car buttons registered to landings below shall not remain at the 106th Floor more than the normal time interval for intermediate stops provided there are one or more other cars in the group at this landing available for dispatch. The key switches provided for the 107th Floor car and hall buttons shall be removable in both positions. The key switch in the 106th Floor "up" button shall be of the spring return type, removable in the "off" position only."

returning from the 107th Floor with car buttons registered to landings below shall not remain at the 106th floor more than the normal time interval at this landing waiting to be dispatched and a supervisory system utilizing terminal dispatching is used.

A separate key switch shall be provided in the shuttle elevator supervisory panel located in the console at Concourse Level for Elevators No. 6 and 7 (North Tower) which when activated will place either or both of the elevators on "Restaurant Service". Under this operation, the elevators shall operate on "Independent Service" from the car only. Hall buttons at the Concourse, 44th floor Skylobby, 67th floor and 107th floor shall register on the light annunciator in each car. Single annunciator indicators shall be provided for each floor and they shall be installed in the panel which contains the car buttons for these floors. This car panel shall normally be concealed by hinged doors, which when opened shall

retract into the car panel box. When one car responds to a registered call, the annunciator indicator in both cars shall be extinguished. When a car arrives at a floor in response to a registered car call, the car and hoistway doors shall open. When the car stops at a floor where front and rear openings occur, only the car and hoistway doors corresponding to the opening designated under "Restaurant Travel" in the "Elevator Schedule and Requirements" contained herein, shall open. When one or both of the key switches are activated, special miniature signs in the hall button faceplates shall illuminate the words "Restaurant Service" and only the car buttons for the Concourse, 44th floor Skylobby 67th Floor (Elevator 7 only) and 107th floor shall be operative in Elevator No. 6 and 7. A special minaturized sign in the hall button fixture shall illuminate on the 67th floor indicating "NOT IS USE" or "NO SERVICE" when Elevator 7 is not being used for "Restaurant Service."

A key switch shall be provided in the starters control panel of Bank D elevators in the 78th Floor Skylobby, of the North Tower. When turned to the "on" position shall disconnect Elevators 93 and 98 from the group operation and arrange them for exclusive service from the 78th floor Skylobby to the 107th floor as follows:

The controls shall be arranged so that the 107th floor car buttons on Elevators 94, 95, 96 and 97 shall be inoperative under the operation. The cars may continue to use the 107th floor as a top terminal but the car and hoistway, doors shall not open and the hall Lanterns shall not illuminate at this level. The 107th floor "down" group hall button shall be connected into the operating circuits of Elevators 93 and 98. Normally with no calls registered one car shall be parked at the 78th floor Skylobby with its car and hoistway doors in the open position and the second car shall be parked at the 107th floor with its car and hoistway doors in the closed position. Should the 78th floor Skylobby car leave

in response to a registered call on a corridor call, the 2nd car at the 107th floor shall proceed to the 78th floor Skylobby and park there with its car and hoistway doors in the open position. Should a car leave the 107th floor in response to a registered car call, the second car at the 78th floor Skylobby shall proceed to the 107th floor and park there with its car and hoistway doors in a closed position.

A special miniturized "NOT IN USE" or "NO SERVICE" sign shall be provided in the car button fixture to indicate car has been locked out for travel to the 107th floor.

A separate switch shall be provided at a location in or near the face plate where designated by the Engineer in the shuttle elevator supervisory panel located in the console for each of Elevators No. 6 and 7 (South Tower). when either or both of these key switches are activated, the respective elevator or elevators shall be placed on "Observation Service". Under this operation, the elevators shall operate on "Independent Service" from the car only. When the elevator or elevators shall arrive at either the Plaza or 107th floor level, the car and hoistway doors shall open. When the car stops at a floor where front and rear openings occur, only the car and hoistway doors corresponding to the opening designated under "Observation Travel" in the "Elevator Schedule and Requirements" contained herein, shall open. A hall button, equipped with a special miniature sign shall be provided between Elevators No. 6 and 7 at the Plaza and 107th floors (East Side). When either or both elevators are placed in "Observation Service" these words shall be illuminated in the button faceplate. Pressure on either of these buttons shall illuminate a corresponding annunciator numeral in the special car panel. This panel shall be normally concealed by hinged doors which when opened shall retract into the car operating box.

A separate three-position key switch shall be provided in the shuttle elevator supervisory panel for each of Elevators No. 16 to 19, inclusive.

When these switches are activated, the respective elevator shall be placed on "Interzone Service". Under this operation, the elevators shall be arranged to travel between the 44th Skylobby floor and the 78th Skylobby floor. When one or more elevators are on "Interzone Service" special miniature signs located in the hall button fixtures shall illuminate the words "Interzone Service" or other approved wording. Pressure on a hall button shall call an elevator to the respective floor or cause the doors of a "parked" car to open. If two cars are on "Interzone Operation", one car shall normally "park" at the 44th Skylobby Level and one car at the 78th Skylobby Level. Similarly, if four cars are on "Interzone Service", two cars shall "park at the 44th Skylobby Level and two cars shall "park" at the 78th Skylobby Level. If three cars are in operation, one car shall "park" at one terminal and the remaining two cars at the opposite terminal. The departure of a car to a terminal, with more than one car in operation, shall simultaneously dispatch a car from the opposite terminal. An adjustable timing device shall be provided which shall close the car and hoistway doors a predetermined interval after the light beams have been interrupted, when shuttle elevators in each group shall operate as specified under the clause hereof entitled "Operation" Shuttle Elevators.

When the above specified key switches are placed in the third position, the elevator or elevators shall be arranged to serve the Concourse, 44th Skylobby floor and 78th Skylobby floor on "Independent Operation" from the car only. The hall button fixtures at these floors shall contain special miniature signs which shall illuminate the words "Interzone Service" or other approved wording. Under this arrangement, car buttons for the floors served (located on the concealed panel for each shuttle elevator) shall become operative. Pressure on a hall button will illuminate annunciation lights located adjacent to the car button in the concealed panel. Special hall lanterns shall be provided in addition to the normal hall lanterns specified. These lanterns shall be

located above each entrance served. The lanterns shall illuminate a special wording to indicate floors served. The control wiring shall be arranged so that any combination of the two types of "Interzone Service" and "Special Service" (as further described herein) cars can be operated at one time from the same riser of hall buttons. For example: Elevator Nos. 16 and 17 could operate between the 44th Skylobby floor and 78th Skylobby floor, at the same time as Elevator No. 18 was operating between the Concourse, 44th Skylobby floor and 78th Skylobby floor and Elevator No. 19 was operating between the Concourse and 44th Skylobby floor.

A separate key switch shall also be provided on the shuttle supervisory panel for each of Elevators No. 16 to 19 inclusive for "Special Service". When these switches are activated, the selected elevator or elevators shall be arranged to serve between the Concourse and 44th Skylobby floor. Under this operating arrangement, the "Special Service" elevators shall return to the 44th floor after expiration of the door open time at the Concourse Level. Pressure of a "Down" hall button at the 44th floor shall cause the doors of a "parked" car to open for loading. An adjustable timing device shall be provided which shall close the car and hoistway doors a predetermined interval after the light beams have been interrupted. The special lanterns described under "Interzone Operation" shall be operative, but shall be wired to illuminate a special wording to indicate that the elevator will serve to the 44th floor only whenever shuttle elevators are removed from group operation, the remaining shuttle elevators shall operate as a group independent of the cars that have been removed.

Key switches shall be provided in the starter's control panel of Elevator No. 50, which when activated shall disconnect the car and hall buttons as required to rearrange the floors served by Elevator No. 50. (The base operation of this elevator shall permit service to all openings as an automatic elevator from car and hall buttons).

242 264 274 284 24-1

Key Switch No. 1 - Cut-out *SB5, SB3, SB2, SB , SERVICE

Concourse, Plaza, 3rd to 7th floors.

Key Switch No. 2 - Cut-out 9th to 40th floor openings.

Key Switch No. 3 - Cut-out 41st to 74th floor openings.

The control wiring shall permit the actuation of any combination of these switches at one time. The control circuits shall also be interlocked to permit the combining of Elevator No. 50 with Elevator No. 6 only when the three key switches described above are in the "off" position.

A limited transfer floor arrangement shall be provided at the 61st floor of Elevators Nos. 63 to 68 in Bank C (North Tower), Elevators 69 to 74 in Bank D (North Tower), and at the 67th floor of Elevators 69 to 74 in Bank D (North Tower). An "Up" hall button only shall be provided at these floors, and the cars shall be arranged to respond to the 61st or 67th floor (as the case may be) car button calls in the "Down" direction only. Key buttons shall be provided for the 67th floor operation. A key switch shall be provided in the starter's control panel of Bank C for Elevators 63 to 68 and two key switches in the starter's control panel of Bank D designated "67th Floor Transfer." The actuation of any of these key switches will discontinue the limited transfer floor arrangement at the floor corresponding to the designation on the key switch.

A key switch shall be provided in the starter's control panel of Elevators 30 to 35 in Bank B (North Tower), which when activated will discontinue car and hall service at the 24th floor by these elevators. When this change is effected, the top dispatching level will become the 23rd floor, and Elevator Nos. 36 to 41 shall provide full service to the 24th floor. When the switch is in the "off" position, the top dispatching floor of Bank B shall be the 24th floor, and service to the 24th floor by Bank C elevators shall be discontinued.

Similarly, a key switch shall be provided in the starter's control panel of Elevators Nos. 36 to 41 in Bank C (North Tower) which when activated will discontinue car and hall service to the 32nd floor. The top dispatching level will then become

*No. SB5 stop at South Tower

the 31st floor, and Elevators Nos. 42 to 47 shall provide full service to the 32nd floor. When the switch is in the "off" position, the top dispatching floor in Bank C shall be the 32nd floor, and service to the 32nd floor by Bank D elevators will be discontinued.

An "Emergency Return" switch for Fire Department use shall be provided in both towers in an approved location adjacent to the Concourse or Skylobby level, as the case may be, for local passenger Elevator Nos. 24, 30, 36, 42, 51, 57, 63, 69, 77, 83, 89, 96 and Shuttle Elevator Nos. 11 and 12, which when operated shall cause the respective elevator car to bypass registered car and hall calls and return the respective elevator car to the Concourse Level or Skylobby Level, as the case may be. The switch shall be of the key operated type and shall be mounted behind a "break-glass" cover.

40. GROUP SUPERVISORY SYSTEMS

A. NORTH AND SOUTH TOWER LOCAL PASSENGER ELEVATORS

Each group of local tower passenger elevators shall be provided with an automatic supervisory control system arranged to effectively coordinate the movement of the individual cars of the group so as to provide the maximum efficiency in serving the building passenger service requirements.

The "Morning Peak" period shall be recognized by means of a "Tork" clock, and an adjustable number of loaded cars in the "Up" direction. During this peak, all elevators shall park with their doors open at the lower terminal level, permitting multiple loading of elevators. If more than one elevator is parked at the floor, only one elevator shall receive the "Up" lantern. After an adjustable period of time (adjustable separately) from normal stop, this elevator shall leave the lower terminal level after its "Up" lantern signal has been transferred to the next car available for loading or from the time a car call has been registered. Should a car be filled prior to the expiration of the adjustable loading time interval, the

car shall immediately be dispatched from the lower terminal. During this peak period, a car shall not park at its last call unless at least a total of three elevators are either traveling to or parked at the lower terminal level.

When two-way traffic is experienced in the building, and the "Tork" clock does not require specific programming the dispatching system shall measure the number of hall calls, the length of time these calls have been registered, direction of calls, and number of loaded elevators, and from this and other appropriate data determine the intensity of traffic. During periods of intermittent traffic, the system shall automatically determine from this data, the number of elevators required to remain in operation to maintain a good level of elevator service. The elevator or elevators not actively responding to car or hall calls (as determined by the dispatching system) shall park either at their last call or in assigned zone or zones, where they shall remain available for dispatch to assigned calls or to calls within assigned zones. The system, however, should maintain a requirement for one car to return to the lower terminal floor. In the event there is temporarily no car at the lower dispatching terminal, the hall lantern of the next car to arrive at the lower terminal shall illuminate immediately upon entering the express portion of the hoistway. Optional provision shall be included in the dispatching system which shall not require a "Down" traveling car to proceed to the lowest terminal, provided the lower terminal demand has been fulfilled by another car or cars. When a car is sent to a zone to park within the zone, the parking operation shall be completed without opening and closing the car and hoistway doors. When a car becomes an available or parked car at its last call, and car calls are registered after this designation has been made by the dispatching system, the elevator shall respond to these calls.

When the intensity of the traffic increases to the point where all cars are required to be in motion, the dispatching system shall determine the point at which the car shall start in response to "Up" or "Down" calls in either of the following ways:

(1) The system shall give preference to registered calls in the following order:

(a) Lower Terminal Demands

(b) "Long-Wait-Down" Calls

(c) "Long-Wait-Up" Calls

(d) "Down" Calls

(e) "Up" Calls

Cars that become available shall be dispatched to points which make elevators available to the preferential calls in the order listed above.

(2) The system shall dispatch cars at the lower terminal or at a low point (provided the lower terminal demand has been fulfilled) and at a top point with the time between dispatches continually adjusted as automatically determined by the traffic requirements, as determined by input data consisting of loading times, round trip times, load in cars, etc. Long-wait calls shall be given preferential service by reversing an available "Up" car at the highest long-wait "Down" call.

The elevators shall provide "Down Peak" service when the "Down" traffic reaches a predetermined adjustable level as determined by the number of "Down" calls and number of cars bypassing "Down" hall calls. During the "Down Peak" period, the requirement to return one car to the lower terminal shall be inoperative. In addition, the elevators shall leave the lower terminals as soon as the car is unloaded, and all cars shall leave the lower terminals as soon as the car is unloaded, and all cars shall terminate their "Down" trips at lower terminal, irrespective of whether a car or hall call for this floor has been registered. The top reversal point shall be

determined by the methods specified under the "Two-Way-Heavy" type of traffic. Means shall be provided during the "Down Peak" period, e.g. zoning operation, to provide uniformly regular service to all floors served.

The number of loaded cars traveling in the "Down" direction shall be constantly totaled in each local passenger bank terminating at an Upper Skylobby. This information shall be provided to the dispatching system of the Shuttle Elevator Bank which feeds it. For example, the totaled information for Banks C & D (Zone 11) shall be supplied to the dispatching system for Shuttle Elevators No. 6 to 11, inclusive. This information will then be used by the Shuttle Elevators Number 6 to 11, inclusive. This information will then be used by the shuttle elevator dispatching system to bias the shuttle elevators to their top terminal.

The traffic load differential experienced in each shuttle elevator group (i.e. the differential between "Up" and "Down" traffic) shall be constantly supplied to the two banks of elevators fed by the shuttle elevator group. When the load differential favoring the "Up" direction reaches a predetermined point, the local elevators in each bank shall be biased toward the Skylobby Level. If a system of preferential calls is used during "two-way" traffic, the Skylobby Floor shall be given increased preference in a manner approved by the Engineer. If a system of parking zones is used during light traffic conditions, the load differential information shall automatically transfer the dispatching method to that described herein for "two-way" intense traffic with low and top type of dispatching.

In the event that any car is delayed for more than a predetermined time interval after it receives a start signal, the system shall automatically permit the remaining cars in the group to respond to

signals and be dispatched in the specified manner. When the cause of the delay is corrected, the car shall automatically return to normal operation unless it has been manually removed from the system.

In the event of failure of the automatic dispatching system, the elevators shall continue to be automatically dispatched by auxiliary means so as to provide emergency service. Failure of the automatic dispatching system shall be indicated by an illuminated signal in the starter's control panel.

In the event of failure of the landing call button circuit, means shall be provided to enable (automatically during such failure) the elevators to provide service for each floor without registration of a call within the elevators. An illuminated signal shall be provided in the starter's control panel to indicate that this emergency operation is in effect.

The Contractor shall submit the complete logic of his traffic supervisory system to the Engineer for his approval.

Should a car delay at a floor beyond a reasonable predetermined time, a light in the starter's panel shall flicker to call attention to the delay. In addition, an audible signal shall sound at the starter panel location.

B. Special Provisions (North & South Tower Local Passenger Elevators)

A key switch shall be provided on the starter's control panel for each bank of local tower passenger elevators to permit the optional selection of one of the following morning peak operation scheduled for these banks of elevators:

(1) All six elevators in each bank shall serve the regular established local zones

(2) Three designated elevators in each bank shall serve only as high as a predetermined intermediate floor in the regular

established zone. The other elevators will serve only those floors above this predetermined floor. The Contractor shall furnish and install a floor directory and hall lantern fixtures as approved by the Engineer. The floor directory shall illuminate only the floors served by each elevator when this operation is in effect.

C. Shuttle Elevators

Provision shall be made to operate the shuttle elevators into separate dispatching groups as follows:

Zone II Shuttle Elevators

(1) Elevators No. 1 to 5 as one operation group.

(2) Elevators No. 6 to 11 as one operation group.

Zone III Shuttle Elevators

(1) Elevators No. 12 to 17 as one operation group.

(2) Elevators No. 18 to 23 as one operation group.

Signs as approved by the Engineer over each Concourse and Skylobby entrance shall illuminate to indicate the local floors served by the shuttle elevators.

The group supervisors system for shuttles shall operate under four basic traffic programs as follows:

(1) Intermittent Traffic Program

(2) Up Peak Program

(3) Two-way Heavy Program

(4) Down Peak Program

General

The control systems for the shuttle groups shall automatically respond to the traffic level by adjusting intervals between cars at each terminal and by maintaining an accurate balance between cars in service and traffic levels.

Intermittent Programs

1. The intermittent program shall be manually selected by the program selector switch or by Tork clock. Under this program the elevators shall start an adjustable time after the registration of the car call or immediately upon the actuation of the load weighing devices indicating that the elevator has been filled to a predetermined load. A car shall proceed to the opposite terminal and shall remain there with its motor generator running. A car at the opposite terminal shall be started simultaneously with the departure of a car which leaves in response to passenger demand.

2. A minimum of two cars per bank shall remain in passenger operation (with means for manual selection of the particular cars). Non-operating cars should park at the Concourse level with motor generator sets off and doors closed. Should the passenger traffic reach a particular determined level, additional elevators shall be activated and control shall automatically be transferred to the two-way heavy program.

Up Peak Program

1. During predetermined times each day (as measured by the Tork clock) or on manual program selection the cars shall be automatically time dispatched from the Concourse leval at the expiration of a computed unloading and loading time interval based on measured traffic. This time interval

shall be measured from the departure of the previous car. Should a car be filled to a predetermined percentage of load prior to the expiration of the time interval or should a car waiting for dispatch be filled to this level, the car shall be dispatched immediately (excepting the condition noted in general requirement 2 below). The cars at the Sky-lobby floor shall return to the lower terminal a predetermined time after the passengers entering or leaving the cars have ceased interrupting the car entrance light beam.

Two-Way Heavy Program

1. During predetermined times each day (as measured by the Tork clock) or on manual program selection, the elevators shall be continually operated between terminals in the following manner:

   a) Cars shall be dispatched from both the top and bottom terminals based on dispatching intervals. The time intervals shall be automatically adjusted based on the passenger loads at the terminal as measured by a pattern of microswitches installed for each car. The interval will be recomputed for each dispatch based on the number unloading and the expected number who will load. The interval will automatically be adjusted upward if cars are late. The interval operation shall have means by which to readily adjust the minimum and maximum settings from the machine room.

   b) Cars filled to a predetermined percentage of capacity shall be dispatched immediately.

c) A car delayed for any reason shall not change the time of the next dispatch but shall be removed from group operation if delayed beyond a predetermined time.

d) When more than one car in a group is at a terminal only one car in the group shall have its "next car" sign illuminated. However, an additional car shall be preselected on a rotational basis. A preselected car will be designated by a flashing light and will become the next car as soon as the previous "next car" is dispatched. At that same time another car with doors open at the terminal will be preselected. All cars shall await their dispatching signal with their doors open.

e) The elevator traffic load shall be constantly measured in both directions of travel. This information shall be used to bias the dispatching interval in favor of the direction of heaviest traffic flow. In addition, the load information in down traveling locals, and up traveling shuttles shall be capable of being used to bias the local or shuttle dispatching system affected in favor of the direction of heavy traffic flow. Details of the proposed shuttle control system and coordination with locals shall be submitted to the Engineer for approval. Circuits used for bias system shall be arranged for ready adjustment so that actual field experience factors can be used for final settings.

Down Peak Program

1. During predetermined times each day (as measured by the Tork clock) or on manual program selection, cars shall be automatically time dispatched

from the Skylobby level at the expiration of a computed unloading and loading time interval based on measured traffic. This time interval shall be measured from the departure of the previous car. Should a car be filled to a predetermined percentage of load prior to the expiration of the time interval or should the car waiting for dispatch be filled to this level, the car shall be dispatched immediately. The cars at the Concourse level shall return to the Skylobby level a predetermined time after passengers entering or leaving the car ceased interrupting the car entrance light beams.

General Requirements of Shuttle Dispatching System During all Periods

1. The loading of each car shall be measured to determine the number of passengers with an accuracy of $\pm$ 3 persons (assuming 150 pounds per passenger.)
2. The number of passengers required for a "load" dispatch shall be a variable depending on the predicted load. However, no two cars in any group shall be permitted to leave the terminal within 7-seconds of each other under any conditions.
3. Criteria used in adjusting future dispatching intervals shall be taken from departure times of previous cars.
4. An automatic damping device shall be provided to remove outdated information. Load data shall affect the dispatching interval for no more than a three-minute period following the measurement of the load.

5. The departure of loaded cars shall not directly affect the interval at that terminal. However, such departures are to be used in computing the expected load and adjusting the interval.

6. Minimum interval must be adjusted based on the number of cars in normal passenger service operation in each group.

7. Elevators shall be so biased so they will return to rotational sequence in a reasonable amount of time. Manual means shall be Provided to restore sequence (i.e., independent service switch).

8. The Contractor shall provide on the group control panel an auxiliary dispatching system which shall permit cars to leave a terminal at a predetermined time after a light beam has been interrupted. This auxiliary system shall operate upon failure of the group dispatching function.

9. At the moment when the continuous illumination of the hall lantern of a particular elevator car is initiated to indicate that the car is the next in sequence to be dispatched, an additional elevator shall also be preselected for advance loading.

   The selection of this elevator car for advance loading shall be indicated by the flashing of its respective hall lantern. When the car selected for dispatch receives its dispatching signal, the preselected car hall lantern shall provide continuous illumination and an additional car shall be preselected for advance loading. The advance loading and preselection pattern shall be in accordance with the following:

   (a) When more than one elevator car is at a terminal, available for loading, the car selected for advance loading shall be selected

on a rotational, non-sequential basis (a selection which is not based on the order of arrival of the car at the terminal).

(b) When only one car is available at a terminal for loading, the car selected for advance loading shall be the next car to arrive at the terminal.

(c) Should a preselected car receive a dispatching signal because of load prior to the departure of the car originally selected for departure, the preloading signal shall be transferred to another car.

D. Below Grade Passenger Elevators

Provision shall be made to operate the "Below Grade" passenger elevators into two separate dispatching groups as follows:

(Group I - Elevators J-1, J-2 and J-3)
(Group II - Elevators K-3, K-4 and K-5)

Each group of elevators shall be provided with an automatic supervisory control system arranged to effectively coordinate the movement of the individual cars of the group so as to provide the maximum efficiency in serving the building passenger service requirements.

The dispatching system shall measure the number of hall calls, the length of time these calls have been registered, direction of calls, number of loaded elevators, etc., and from this data determine the intensity of traffic. During periods of light traffic the system shall automatically determine from this data, the number of elevators required to remain in operation to maintain a good level of elevator service. Two elevators in each group shall park at the Concourse Level and one elevator shall park at Elevation 294. The elevators shall be available for dispatch to assigned calls or to calls within assigned zones. When

a car is sent to a floor to park, the parking operation shall be completed without opening and closing the car and hoistway doors. When a car becomes an available or parked car at its last call, and car calls are registered after this designation has been made by the dispatching system, the elevator shall respond to these calls.

When the intensity of the traffic increases to the point where all cars are required to be in motion, the dispatching system shall determine the point at which the car shall start its response to "Up" or "Down" calls in either of the following ways:

(1) The system shall give preference to registered calls in the following order:

Upper Terminal Demands

"Long-Wait-Up" Calls

"Long-Wait-Down" Calls

"Up" Calls

"Down" Calls

Cars that become available shall be dispatched to points which make elevators available to the preferential calls in the order listed above.

(2) The system shall dispatch cars at the upper terminal and at a top point with the time between dispatches continually adjusted as automatically determined by the traffic requirements, as determined by input data consisting of loading times, round trip times, load in cars, etc. Long-wait calls shall be given preferential service by reversing an available "Down" car at the highest long-wait "Up" call.

The elevator shall provide "Up Peak" service when the up traffic reaches a predetermined adjustable level as determined by the number of up calls and car loading. The cars shall reverse after they are unloaded at the Concourse.

The elevators shall provide "Down Peak" service when the "Down" traffic reaches a predetermined adjustable level as determined by the number of "Down" calls and car loading. In addition, the elevators shall leave

the lower terminals as soon as the car is unloaded, and all cars shall terminate their "Up" trips at Concourse Level, irrespective of whether a car or hall call for this floor had been registered. The lower reversal point shall be determined by the methods specified under the "Two-Way Heavy" type of traffic.

In the event that any car is delayed for more than a predetermined time interval after it receives a start signal, the system shall automatically permit the remaining cars in the group to respond to signals and be dispatched in the specified manner. When the cause of the delay is corrected, the car shall automatically return to normal operation unless it has been manually removed from the system.

In the event of failure of the automatic dispatching system, the elevators shall continue to be automatically dispatched by auxiliary means so as to provide emergency service. Failure of the automatic dispatching system shall be indicated by an illuminated signal in the starter's control panel.

In the event of failure of the landing call button circuit, means shall be provided to enable (automatically during such failure) the elevators to provide service for each floor without registration of a call within the elevators.

The emergency stop switch shall interrupt the power supply and apply the brake independently of the regular operating device.

41. CAR OPERATING DEVICE *

Local Passenger Elevators - North and South Tower Elevators (Except Elevator 99) and Elevators J-1, J-2, J-3, K-3, K-4, and K-5

The operating device for each car shall consist of a car operating panel which shall include a series of pushbuttons or electronic "touch" numbered to correspond to the floors served and various additional switches,

* See Addendum No. 3, April 1, 1968, attached hereto in Book III.

buttons and light jewels including emergency stop button, alarm button, and a door-open button. In addition, each car shall be provided with a service cabinet having a sliding door or hinged doors which will retract into the car return panel in the "open" position and lock and containing inspection switch, blower switch, car light switch, key operated motor generator switch and pilot light, 110 volt receptacle and other equipment required to service the elevator.

The car operating panel shall include "Car Stop" lights in the car buttons. Each car button shall illuminate to show that a call is registered for that floor.

The car operating panel fixture faceplates shall be mounted flush with the car enclosure front return panel and shall be constructed of stainless steel as approved by the Engineer.

A second operating panel shall be provided in each car. This panel shall include only such operating buttons, switches and light jewels as are used for automatic operation. This second operating panel shall include "Car Stop" light jewels numbered to correspond with the car buttons. The pressing of a car button on either one of the operating panels in the car shall cause the illumination of the corresponsing jewels in both operating panels. The operating panel faceplates shall be mounted flush with the car enclosure front return panel, and shall be constructed of stainless steel as approved by the Engineer.

Should a car delay at a floor beyond a reasonable predetermined time, a light in the starter's panel shall flicker to call attention to the delay. In addition, an audible signal shall sound at the starter location.

42. STARTER'S CONTROL PANELS

North and South Tower Local Passenger Elevator Banks, Below Grade Banks - (Bank 1 - Elevators J-1, J-2 and J-3; Bank 2 - Elevators K-3, K-4 and K-5)

These panels shall contain the starter's operating equipment described herein and shall have the face plate assemblies of similar design and finish as the starter's indicator panels and shall be so arranged that they may be located below the starter's indicator panel to form a multiple unit assembly appearing as a single fixture. Indicator and control panels shall be equipped with hinges and locks to provide ready access to panel interiors.

A key operated switch for each elevator with pilot light numbered to correspond with the designated number of the elevator shall be provided by the Contractor. The operator of this switch shall take the car "out of service" or place it "in service" as previously described. The pilot lights when illuminated shall show which motor generator sets are running.

Special operation switches required by these Specifications shall be provided by the Contractor.

Intercommunication system master station and space for telephone shall be provided by the Contractor.

Should a car delay at a floor beyond a reasonable predetermined time or when the alarm button has been pressed, a light on the starter's panel shall flicker to call attention to the delay or alarm. In addition, an audible signal shall sound at the starter's location.

43. STARTER'S INDICATOR PANEL

North and South Tower Local Passenger Elevator Banks and Below Grade Banks - (Bank 1 - Elevators J-1, J-2 and J-3; Bank 2 - Elevators K-3, K-4 and K-5)

Each bank of passenger elevators shall be equipped with a starter's panel. This panel shall contain the starter's indicator equipment described herein and shall have a faceplate of stainless steel incorprating the following signal indications:

(1) A combined single panel shall be provided for Banks A, B, C and D in Zone I to be mounted in a console or panel arrangement located at the Concourse Level and the panels for Banks A, B, C and D in Zones II and III shall be mounted at their respective skylobbies. Panels for Elevators K-3, K-4 and K-5 and J-1, J-2 and J-3 shall be located in the consoles in the lobby closest to these elevators, mounted at their respective skylobbies.

(2) A waiting passenger indicator consisting of a double row of numerals corresponding to the floors served by the group of elevators and so arranged that green numerals shall be illuminated when the respective "Up" landing buttons are pressed and red numerals illuminated when the "Down" landing buttons are pressed. Each numeral shall remain illuminated until the call has been answered.

(3) A position indicator consisting of a vertical row of numerals for each elevator in the group corresponding to the floors which are served by that elevator. As each elevator travels through the hoistway, its position shall be indicated by the illumination of the numeral corresponding to the landing at which the car is stopping or passing. A position shall be included to indicate that the elevator is in the "express" portion of the

hoistway. The direction of travel shall be indicated by "Up" and "Down" illuminated indications below each position indicator.

(4) Nonstop indicators, numbered to correspond with the designated number of the elevator, shall illuminate when the car is "Non-stopping" or bypassing hall calls.

44. STARTER'S PANEL FOR SHUTTLE ELEVATORS AND FREIGHT ELEVATORS NO. 48 TO 50

A starter's panel shall be provided mounted in a console at the Concourse Level. The panel shall include the following:

(1) Readout assemblies to indicate each floor location of the shuttle elevators (e.g. each floor from 1 to 44 for Zone II shuttles). As the shuttle car travels from the Concourse to the Skylobby, the readout assembly will illuminate the consecutive numbers corresponding to the floor being bypassed by the elevators. In addition, readout assemblies shall be provided for the Service Elevators No. 48, 49, and 50, also arranged to show the floors at which the elevator is stopped or bypassing including indications in the express zone. The readouts shall be of the projection type of the instantaneous transfer type. Characters shall be 1 inch in height.

(2) Nonstop indicators numbered to correspond with the designated number of the shuttle elevator which shall illuminate when the car is filled to a predetermined percentage of capacity.

(3) An indicator for each shuttle elevator which shall flicker when the car or hoistway doors are prevented from closing.

(4) Master station for the intercommunication system.

(5) Special key switches and selector switches required by these Specifications.

(6) A light in the panel which will flicker when the car is delayed beyond a predetermined time or when the alarm button has been pressed. An audible signal shall also sound at the starters location.

45. GEARLESS HOISTING MACHINES

Where gearless hoisting machines are specified, the elevator machines shall be of the gearless double-wrap traction type designed with a slow speed direct current motor directly connected to a driving sheave and brake pulley. The machines for the shuttle elevators shall be compactly designed to fit within the machine room areas indicated on the Contract Drawings. The machines shall be mounted on a structural bedplate with the shuttle machine bedplates mounted on a sound isolation pads which provide a deflection adequate to dampen the disturbing frequencies. The Contractor shall furnish and install the elevator machine beams in place with any necessary bearing plates, securely fastened to the structural supports. The Contractor shall furnish and install any additional structural members required for the installation of the equipment, such as shelf angles, supports for governors. He shall provide rope guards for machines and selector tape guards. Gearless single wrap traction machines are acceptable on Local Elevators Nos. 51 to 56 and 75 to 80, providing the dead-end hitch beams are installed at the secondary level as shown on the Contract Drawings.

The machines of the shuttle elevators shall be designed for an acceleration rate which shall provide brake-to-brake times of 28 seconds from Elevation 310 to Elevation 836 and 43 seconds from Elevation 310 to Elevation 1248. The factors of safety, sheave diameters, used in the design

of the machine components shall be as outlined in the ASA-A-17-1 Code. The motors shall be designed to meet the requirements of the latest National Electrical Manufactures Association standards for motors.

Dustproof antifriction bearings of ample capacity to sustain the load shall be provided with adequate and easily accessible provision for lubrication.

A secondary sheave complete with lubricated bearings shall be provided. The sheaves shall be sound isolated from the elevator machine beams in a manner which will provide a deflection of the sound isolating material adequate to dampen the disturbing frequencies.

46. WORM-GEARED MACHINES

Where worm-geared machines are specified, the geared traction machines shall be designed to meet the severe service encountered in elevator operation. A properly grooved sheave shall be driven through a worm and gear by a moderate speed motor. The sheave wheel shall be mounted with heavy antifriction bearings on a rigid shaft or shall be firmly pressed onto a shaft supported by sleeve or antifriction bearings of ample capacity.

The gear housing, brake support and motor support shall be a single casting or they shall be mounted on a rigid bedplate. The gear housing shall be divided horizontally at the center line of the shaft to provide access to the worm gear. A gasketed inspection handhole shall be provided in the lower half of the housing to permit inspection of the gear. Suitable drain plugs, overflow pipes and oil level indicator shall be provided.

The sheave and gear spider shall be cast integral. The bronze worm gear shall be securely bolted to the spider. The sheave material shall be of semisteel of the proper hardness to give minimum wear of sheave and cables.

The worm gear shall be machined from a heavy ring casting of special gear bronze and shall have accurately hobbed teeth. Bolts which secure the gear to the spider shall be fitted into reamed holes to secure a snug fit.

The worm and its shaft shall be accurately machined in one piece, of special forged steel. The brake wheel shall be securely mounted on the worm shaft and machined to obtain a smooth and accurate face. The worm shaft shall be mounted on at least two bearings, one of which shall be an oversize double acting preloaded ball bearing or a self-aligning thrust bearing, and the other a bronze sleeve guide bearing. An oil seal shall be provided at the motor end of the work shaft. The thrust bearing shall be removable without dismantling the machine.

The brake shall be spring actuated, for direct current, electrically released, of heavy construction and have a proper braking area for the load and speed specified. There shall be two shoes actuated by two separate compression springs. The brake shall have sufficient power to stop and hold the car with contract load.

47. GUIDE RAILS

The Contractor shall furnish and install guide rails to meet the American Safety Code for elevator requirements with suitable brackets and clamps for each elevator, for attachment to the building structural members. Car guide rails and car frame shall be so located that the entire car assembly shall be in true balance in the guides. Brackets, clamps and bracket supports as required shall be installed by the Contractor for the counterweight rails. Supports for car and counterweight brackets shall be provided at intermediate levels under another contract so that the maximum spacing does not exceed the limits set forth in Schedule A included in these Specifications. The Contractor shall provide all guide rail backing necessitated by this bracket spacing.

All rails shall rest on and be attached to steel footing plates on channels set flush and concreted in the pit floors. Attachment of rails to footings shall be by means of suitable brackets or angles, fastened to footings and bolted to each rail with not less than four bolts.

Joints and backs of car rails and fishplates shall be accurately machined with tongue and groove in the ends of the rails at the center of the railhead and the base, forming matched joints fitted with fishplates not less than 5/8 inch thick and 12 inches long and fastened to each rail with not less than four 5/8 inch through bolts or joints may be accurately machined with tongues and grooves at the centers of the railheads and with the backs of the rails accurately machined to form seats for machined fishplates, as above specified. Additional rail clips shall be provided, if necessary, to obtain proper rail rigidity at no additional cost to the Authority.

Special brackets shall be installed by the Contractor at the top flange of all separator beams. In addition, special extension brackets shall be installed by the Authority on the bottom flange of those separator beams where floor height exceeds the allowable limits set forth in Schedule A which is included in these Specifications. The Contractor shall arrange his brackets for connecting to rectangularly shaped box separator beams shown on the Steel Drawings. Steel Drawings and revisions thereto made during the performance of this Contract will be made available for the Contractor's reference at the office of the Authority. Special brackets shall be installed if necessary to suit the structural steel as shown on the Steel Drawings and revisions thereto. When each building is completed, the Contractor shall check the alignment of the rails and shall realign the rails

where the alignment has been changed by action of the building structure. The rail realignment shall be performed within one year after building completion at the direction of the Authority and at no additional cost to the Authority. The rails shall be realigned by squaring all connections, loosening, lubricating and tightening all rail bracket clips.

Joints for counterweight rails shall be the same as for car rails, except fishplates shall be not less than 1/2 inch thick and 9 inches long and fastened to each rail with not less than four 1/2 inch bolts.

All joints shall be so located as not to interfere with supporting clamps and brackets. Car and counterweight rails must be thoroughly cleaned and smoothed before cars are put in operation.

Shims used to secure rail alignment shall be so designed that they will remain in position even though the fastening bolts may be loosened.

Car rails for all local cars with a speed of 1000 feet per minute or over shall have a minimum section of not less than 18.5 pounds per foot. The shuttle elevator rails have a minimum section of not less than 18.5 pounds per foot, for the counterweight rails and 22 pounds per foot for the car rails.

48. CONTROL SYSTEM

A control system shall be furnished to govern the starting, stopping and direction of travel of the elevators. Voltage control shall be effected by means of a uniformly varying D.C. voltage applied to the elevator motor.

The control equipment for the local elevators shall provide a smooth acceleration and retardation as approved by the Engineer. This smooth operation shall be obtained under stable conditions which

provide for a maximum 4.5 seconds brake-to-brake time for a typical floor run with a balanced load and a maximum of 9.0 seconds from "start" of door closing at one floor to the "fully opened door" position at the next floor under balanced load conditions with a maximum premature door opening of 4 inches from floor level. These performance times shall be maintained without "hunting" at the floor levels.

The control system for the shuttle elevators shall provide a smooth acceleration and deceleration with control arrangements provided which will eliminate the "jump" effect occasioned by momentary rope stretch during the starting operation.

A compact motor generator set with amply proportioned bearings shall be provided for the elevator. This set shall be mounted on a cast iron or steel bedplate and aligned and balanced to minimize vibration. The motor generator set shall be located where indicated on the Contract Drawings and isolated from the floor or machine beams by rubber pads of proper density. Institute of Electrical and Electronic Engineers' standards for continuous running under full load with a 50° C. temperature rise, shall be met. If a D.C. exciter is required, this may be mounted on the motor generator set or provided as a separate unit. The speed of the motor generator set shall not exceed 1800 rpm. The starting circuits of the motor generators shall be so arranged that the motor generators in each bank of elevators will be started in sequence.

49. ELEVATOR CONTROLLER

An electro-magnetic controller shall be provided to control starting, stopping and the speed of the elevator motors, and also to automatically apply the brake if any of the safety devices operate or the power fails from any cause.

All controllers shall be of modular construction, using relays of the shuntless type. Controllers shall be enclosed in ventilated sheet metal cabinets finished in black enamel. Openings shall be provided in cabinets for easy access.

50. CAR AND COUNTERWEIGHT GUIDES

All Elevators except Elevators P-1, J-4, K-1, K-2, and Elevators No. 99 in each Tower shall be provided with car and counterweight rail guides of the roller type.

Each roller guide shall be of an approved type consisting of three wheels tired with a durable resilient material, each rotating on ball bearings having sealed-in lubrication, all assembled on a substantial metal base and mounted so as to provide continuous contact of all wheels with the corresponding rail surfaces under all conditions of loading and operation. The wheels shall run on three finished rail surfaces. The roller guides shall be properly secured at top and bottom on each side of car sling and counterweight frame. When oil buffers are attached to the bottom of the counterweight, additional roller guides shall be installed on each side of buffer frame. The roller guides shall run on dry guide rails. Sheet metal guards shall be provided to protect wheels on top of car and counterweight. Roller wheels for the car shall not be less than 6 inches in diameter for the elevators with a speed of 500 feet per minute and 10 inches in diameter for the remaining elevators, and roller wheels for counterweights shall be not less than 3-1/2 inches in diameter for

elevators with a speed of 500 feet per minute and 4-1/2 inches in diameter for the remaining local and service elevators and 8 inches for shuttle elevators, mounted on ball bearings. Individual spring pressure shall be provided for each rocker arm, and all car roller guide assemblies used with elevators having a speed in excess of 1000 feet per minute or above, shall be equipped with hydraulic cushioning units.

Elevator cars and counterweights of Elevators P-1, J-4, K-1, K-2 and No. 99 (in each Tower) shall be equipped with sliding guide shoes. These guides shall be mounted on the top and bottom of the car frame and counterweight frame.

51. COUNTERWEIGHTS

Each elevator shall be suitably counterbalanced for smooth and economical operation. Cast iron weights shall be contained in a structural steel frame properly guided with suitable guide shoes. The counterweight shall be equal to the weight of complete elevator car and about 40 per cent of the specified load. Each weight shall be truly balanced with the weight equally distributed across the width of the frame. Where occupied space occurs below the elevator pits, counterweight safeties shall be provided in accordance with the requirements of the ASA-A17-1 Code. Flexible guide clamp, counterweight safeties shall be provided on all cars except Elevator No. 50 in each Tower, and Elevators J-1, J-2, J-3, J-4, K-1, K-2, K-3, K-4, K-5, P-1 Elevator No. 99 in each tower shall be provided with an instantainable type counterweight safety.

52. CAR FRAMES, SAFETIES AND GOVERNORS

The car frame, safety and governor designs shall meet the requirements of the ASA-A17-1 Code. Flexible guide clamp type safeties shall be

provided for all elevators except Elevator No. P-1 and Elevator No. 99 in each tower which shall be provided with instantaneous type safeties. Duplex safeties, where used, shall function approximately simultaneously. The governor tension frames for the shuttle elevators shall be securely tied down to the building steel to prevent excessive jump of the tension device on emergency stops.

Each car frame shall consist of structural steel members which are securely riveted or bolted together and the frame shall be so reinforced and braced as to relieve the car enclosure of undue strains. The safety, of type required by the ASA A17-1 Code, shall be mounted on the bottom members of the car frame and shall be operated by a speed governor located over the hoistway. The safety shall be arranged to stop the car whenever excessive descending speed is attained and means shall be provided to cut off power from the motor and apply the brake prior to application of the safety.

53. HOISTING AND GOVERNOR CABLES

Each elevator shall be provided with hoisting cables of sizes and numbers sufficient to comply with the requirements of the American Standard Safety Code for elevators A17.1 -- 1965 and as approved by the Engineer. The Contractor shall definitely indicate on his shop drawings the number and sizes of cables proposed to be used, together with the name of the manufacturer, the type, ultimate listed strength in tons, and the proper working load in tons.

The ends of the hoisting cables shall be properly secured to the car and counterweight headers (or to the dead-end hitchplates, as the case may be), with adjustable rope shackles having individual tapered, babbitted sockets. Screw adjustment shall permit equalization of the tension in all ropes. All ropes shall be prestressed and be similar and equal to those manufactured by American Steel & Wire, Bethlehem, or Roebling.

Governor cables shall be not less than 3/8 inch in diameter, steel, specially designed for elevator service. The two ends shall be securely fastened together at the car and shall be attached to the safety operating mechanism. The governor cable shall pass over the governor sheave and over a tension device of the adjustable spring type at the bottom of the hoistway, tied down. All governor cables shall be eight strands of 19 wires each, formed around a fiber core or center. All hoist ropes shall be cut and tagged in sequence.

54. COMPENSATING ROPES

Elevators to receive compensating ropes as shown in the section entitled "Elevator Schedule and Requirements," shall be provided with compensating ropes secured to the car frame and counterweight. Compensating ropes shall be prestressed and of same manufacture as hoisting cables, unless otherwise permitted by the Engineer. Necessary tension sheave and frame shall be included for each pit and the weight of the sheave, frame and compensating repes shall compensate for the weight of the hoist ropes.

The compensating sheave frame shall move downward with the stretch of the compensating ropes, but its upward movement shall be limited to that necessary to compensate for temporary changes in rope length due to temperature and humidity.

All elevators with a speed of 800 feet per minute and above shall be equipped with tie-down devices. These tie-down devices shall prevent the counterweight from jumping in the event the car safety should apply or the car should strike its buffer. The Contractor shall provide the tie-down channels as indicated on the Contract Drawings.

The Contractor shall design the rope compensation car and counterweight hitches on the shuttle cars to be centered on the centerlines of the car and counterweight guides to maintain balance throughout their length of travel.

55. HOISTWAY DOOR HANGERS AND TRACKS *

The Contractor shall furnish for each hoistway door sheave type two point suspension hangers and tracks complete. Sheaves shall be hardened steel, ground and not less than 2-3/4 inches in diameter with ball bearings sealed to retain grease lubrication and mounted on steel housings arranged for attaching to the doors on two cap screws. Hangers shall be equipped with ball

4. "Hoistway Door Hangers and Tracks, Page C-86: Add the following to this paragraph: "Special hangers as required shall be provided at the Concourse Level openings of the Shuttle Elevators to provide for flush transom panels over the slow and fast speed doors of these entrances".

motion from one door panel to the other.

56. CAR AND HOISTWAY DOOR OPERATION

Doors on each car and at each hoistway landing shall be operated quietly and smoothly by an electric operator which shall open the car door and hoistway door simultaneously and close the car door and hoistway door simultaneously.

*See Addendum No. 3, April 1, 1968, attached hereto in Book III.

Unless otherwise specified, the opening speed shall be not less than 2-½ feet per second but closing speed shall be reduced to 1-½ feet per second. The opening and closing speed of Elevators No. 48, 49 and 50 shall be 2-½ feet per second when operating on "With Attendant" operation. The opening time for the Elevator J-1, J-2, J-3, K-3, K-4, and K-5 shall be not more than 2.0 seconds; closing time for these elevators shall be increased to 3.7 seconds. The opening times under "Automatic Operation" for Elevator Nos. J-4, K-1, and K-2 shall be 2-½ seconds; Elevator Nos. 99 and P-1 shall be 3-½ seconds. The closing time for Elevator Nos. J-4, K-1, and K-2 shall be increased to 4 seconds; Elevator Nos. 99 and P-1 shall be 4-½ seconds.

An electric contact for the car door shall be provided which shall prevent elevator movement away from the landing, unless the door is in the closed position as defined in the ASA A17-1 Code.

A protective device shall extend the full height and project beyond the front edges of both car and hoistway doors for Elevators Nos. 1-23 inclusive 48, 49, 50, and 99 in each tower and J-4, K-1, K-5 and P-1. Should this device touch a person or object while the car doors are closing, the car and hoistway doors shall reopen. The devices shall be fully retractable.

Each hoistway door shall be equipped with a positive electromechanical interlock and auxiliary door closing device so that the elevator can be operated only after the interlock circuit is established. When the elevator is on automatic operation, the interlock zone shall be decreased to full closure. The interlock operation shall comply with the ASA A17-1 Code.

When operating on "Independent Operation", the doors shall open automatically as the elevator is leveling and shall close when the "start" button is pressed. The elevator attendant may, at his discretion, stop and reverse the movement of the doors by removing pressure on the "start" button. In case of power interruption, or failure of the operator, it shall be possible to operate the doors manually from within the car.

Reversal of the doors while the local elevators are being operated on automatic operation shall be accomplished by pressing the "Door Open" button.

57. INSPECTION AND MAINTENANCE SWITCHES

On the tops of all elevator cars, means shall be permanently provided to operate each elevator from on top of the car during adjustment, inspection, maintenance and repair. The operating means shall be of the continuous pressure type and the speed of the car shall not exceed 150 feet per minute. It shall operate the car only when the car doors and all hoistway doors are closed. The switch shall be located in the car operating panel. Hoistway access switches shall be provided as required by the ASA A-17-1 code.

58. ELECTRIC INTERLOCKS AND DOOR CONTACTS

The doors at each hoistway landing shall be provided with approved type hoistway door interlocks of the hoistway unit system type, arranged for and provided with service and emergency keys as required by the ASA A17-1 code.

The doors of elevator cars shall be equipped with approved electric contacts conforming to the requirements of the ASA A17-1 code.

If two independent, electrical circuits are used in the same door interlock box of the circuits, the operating fuses on the control board shall blow immediately.

The Contractor shall provide emergency exit contacts in accordance with the requirements of the ASA A17-1 code on the emergency exit doors of Elevator No. 49 and Elevator 5 in the hoistway between the Concourse and 44th floors.

59. DOOR REVERSAL DEVICE

The Contractor shall provide door reversal devices in accordance with the following Specifications on Shuttle Elevators 1 through 23 in each Tower.

An electronic device shall be provided on each elevator car, that will adjust the "Door Open" time at all intermediate floors to conform to traffic movement. It shall close the doors automatically, momentarily after the last entering and leaving passenger. The electronic device shall have at least three light beams of the infra-red or ultra-violet type.

There shall be two (2) separate adjustable door open times for stops made at intermediate floors. One, a long door open time of approximately 3 seconds and the other a short door open time of approximatley 1/2 to 1 second. When a car makes a stop in response to a car call, the initial timing may be the longer time. A passenger leaving the car shall break the light beams and automatically set up the short door time. When a car makes a stop in response to a hall call, the initial timing will be the longer time. Entering passengers may break the light beams without affecting the initial timing. After the expiration of the initial timing, the doors will close; however, should a passenger break the light beams while the doors are closing, the short door time will be automatically set up to reclose the doors.

The electronic device shall be a detecting device and shall operate at both terminal and intermediate floors to prevent the car and hoistway doors from hitting a person or sizeable object is in the doorway. It shall cause the doors to stop and reopen sufficiently to clear a person or object, if, while closing, a person or object enters the doorway.

If, for any reason, the doors are held open for an extended time by a passenger continually standing in the entrance -- holding the door -- or pressing the "Door Open" button, a buzzer shall sound and the doors shall close at reduced speed independent of the reversal devices.

A keyed switch shall be provided in the car station to cut out the electronic device, if it should fail, permitting operation of the elevator with its rubber protective device.

Information regarding the interruption of the light beams indicating that the shuttle cars are either loading or unloading shall be available to the shuttle dispatching system. This information shall be used to assist in the selection of the most suitable shuttle car or cars for dispatch and the interval timing from both terminals.

60. DOOR DETECTING DEVICE

The Contractor shall install a detection device on all car doors of North and South Tower local passenger elevators (except Elevator 99 in both towers) and Elevators K-3, K-4, K-5, J-1, J-2, and J-3. The door detection device shall comply with the following:

> An electrically operated proximity detector device shall be installed on the leading edge of the car doors. This device shall contain specially designed electronic tubes and suitable antennae enclosed in an insulated metal chassis so that the antennae, electronic tubes, and associated equipment are not visible. The device shall create a three-dimensional zone of detection for virtually the entire height of the door opening. This zone of detection shall extend a short distance in front of the leading edges of both the car doors and the hoistway doors. The doors shall be prevented from closing from their fully open position if a person within the zone of detection causes the detector to operate. The zone of detection shall move forward as the doors close and the presence of a person within this zone shall operate one or more of electronic tubes to stop and reopen the doors, after which the doors shall again start to close. A passenger entering or leaving the car shall not cause the doors to stop and reopen unless the doors reach a predetermined proximity to the passenger.

After a stop is made, the doors shall remain open for an interval to permit passenger transfer, after which the doors shall close automatically. The interval that the doors remain open shall be less for a stop made in response to a car button call only than for a stop made in response to a landing button call.

If the doors are prevented from closing for approximately fifteen seconds by operation of the detector device, the doors shall close at a reduced speed independent of the detector device. While the doors are closing at a reduced speed, a loud buzzer located on the car shall sound, and shall register visibly in the starter's panel.

61. AUTOMATIC SELF-LEVELING

Each elevator shall be provided with a self-leveling feature that will automatically bring the car to the floor landings within a tolerance of ½ inch under all loading and unloading conditions without "hunting". This self-leveling shall, within its zone, be entirely automatic and independent of the operating device and shall correct for overtravel and rope stretch. The car shall also be maintained approximately level with the landing, irrespective of load. The final leveling operation at the terminal landings of the two stop shuttle elevators shall be performed through hoistway leveling switches or other methods as approved by the Engineer.

62. HOISTING MOTOR (BELOW GRADE ELEVATORS AND ELEVATOR NO. 99 IN EACH TOWER)

a. The machine motor of "Below Grade" elevators shall be direct current, slow speed type, reversible and shall have high starting torque with low starting current and shall be designed to stand the severe loads encountered in elevator service. It shall be rated in accordance with the standards of the AIEE

for 60° C., 30-minute continuous operation motors, and shall have sufficient capacity to operate with the contact load and speed without overheating.

63. CAR PLATFORMS

a. The car platforms shall consist of structural steel or aluminum frames provided they meet code requirements filled with two layers of wood flooring and a top wood flooring of plywood or other approved smooth surface material. The underside of the car platform shall be covered with sheet steel. The platform shall be equipped with a metal threshold plate of design and construction similar to the main floor or lower terminal hoistway door sill. The platform shall be mounted on rubber pads supported on an auxiliary steel frame fastened to the car frame. This arrangement shall form an isolating cushion between the car and steel car frame. Platforms of all-steel construction are acceptable. The car platform for Service Elevators No. 48, 49, 50, and 99, J-1, J-2, J-3, J-4, K-1, K-2, K-3, K-4, K-5 and P-1 shall be recessed 3/16 inch and shall be provided with a resilient studded tile flooring as approved by the Engineer. The toe guards underneath the platform shall have a removable section for junction box access.

Except where otherwise specified hereinbefore, the elevator platforms shall be recessed approximately 9/16 inch to receive carpeting which shall be provided under another contract. The car door thresholds shall be of extra width (even with the front return panels) to provide a continuous line of carpeting at the car door openings.

64. FIXTURE FACEPLATES

The metal for the faceplates will be provided by the cab enclosure manufacturer. The Contractor shall drill, punch, provide hardware and assemble and return the faceplates to the cab enclosure manufacturer for finishing and fitting into the cab. Transportation charges will be paid by the cab enclosure manufacturer.

65. HALL LANTERNS

The Contractor shall furnish and install "Up" and "Down" waiting passenger lanterns at all intermediate landings and single lanterns at the upper and lower terminal landings of the local passenger elevators, Elevators J-1, J-2, J-3, K-3, K-4, K-5, and all passenger, interzone and restaurant openings of all shuttle elevators in accordance with drawings to be furnished by the Authority. Each lantern fixture shall contain a single stroke gong.

Two hall lantern fixtures shall be provided at the Concourse opening of each shuttle elevator. These lanterns shall be mounted adjacent to the corridor face of the columns projecting out between each shuttle elevator.

As soon as a car has reached a predetermined distance from the floor and is going to stop at that floor, the corresponding hall lantern will be illuminated and the gong will sound whether the hall button has been pressed or not. The hall lantern shall remain illuminated until the car leaves the landing. Should a car, in making a floor stop over travel a short distance, the hall lantern for the floor shall remain illuminated, indicating the original direction of car travel.

66. CORRIDOR HALL BUTTON FIXTURES

Corridor hall button fixtures shall be provided with "Up" and "Down" buttons at the intermediate landings and single buttons at the terminal landings of all local passenger elevators in locations designated by the Engineer. Each corridor hall button unit shall be of the electronic type or push button type, but in any event, shall be arranged to illuminate when a corridor button is pressed. Hall button faceplates shall be constructed in accordance with a design to be furnished by the Authority.

One riser of corridor hall button fixtures shall be provided for each bank of passenger elevators.

67. CAR PROGRESS INDICATORS

Car progress indicators shall be provided over each car entrance of the shuttle elevators. The progress indicators shall consist of floor indications for openings served by the elevators under normal group passenger operation, interzone service, restaurant or observation service (e.g. Concourse, 44th Floor, Restaurant) with a narrow horizontal lighting strip (approximately 1/4 inch high) connecting the floor opening indications arranged to continually illuminate the portion of the lighting strip corresponding to the position of the elevator between the floor indications. The indicator shall also contain a numeral for each floor served which shall illuminate when car arrives at the floor. The elevators terminating at Zone II Skylobby shall have a total of nine indications. The elevators terminating at the Zone III Skylobby shall have a total of sixteen indications. The elevators terminating at the top of the building shall have a total of twenty-two light indications.

68. CAR POSITION INDICATORS

An electric position indicator shall be installed over the entrance of all elevator cars, except for Elevators J-4, K-1 and all shuttle elevators. The indicator shall consist of a flush-mounted stainless steel faceplate containing plastic floor numerals, with a small shielded light behind each numeral. As the car travels through the hoistway, its position shall be indicated by the illumination of the numeral corresponding to the landing at which the car is stopped or passing. The position indicator numerals shall be cut out of the car door header which shall serve as a faceplate. This header shall be arranged to swing for maintenance purposes. The position indicator lights shall remain illuminated when the motor generator is shut down. A separate indication shall be provided to indicate that the elevators are in the blind hoistway.

69. ELEVATOR APPURTENANCE DESIGNS

The Contractor shall provide 1130 hall lanterns and 262 corridor hall button fixtures in accordance with the designs shown on Contract Drawing L-AB-1. All other hall lanterns and corridor hall button fixtures required to be provided under this Contract shall be in accordance with the Contractor's standard designs. Where hall lanterns and corridor hall button fixtures are to be provided and the Engineer directs the Contractor to install hall lanterns and/or corridor hall button fixtures in accordance with the designs shown on Contract Drawing L-AB-1 in lieu thereof the Contractor will be compensated in accordance with such prices set forth in the Form of Contract entitled "Unit Prices."

The Contractor shall provide car position indicators and car progress indicators in accordance with the designs shown on Contract Drawing L-AB-1.

Unless otherwise specified and/or shown on the Contract Drawings, exposed metal of elevator appurtenances shall be 300 series, non magnetic stainless steel with a No. 7 finish.

70. WORK LIGHTS AND RECEPTACLES

Each elevator car shall be provided with suitable pull chain receptacles fitted with wire lamp guards in top and bottom of car. In addition, a suitable duplex plug receptacle shall be provided on top of each car. Fan connection shall use one of these outlets, thus providing easy removal for maintenance purposes.

71. NORMAL STOPPING DEVICES

The Contractor shall furnish and install on the top of each car, slow-down and normal stopping devices, wholly enclosed in dustproof steel cases. The devices shall be so arranged that as the car approaches either terminal landing, a roller with noiseless tread, mounted on a movable arm, will come into contact with cams located in the hoistway, and through the operation of the stopping device, bring the car automatically to a smooth stop at the terminal landing. Roller of switch shall engage on full area of cam surface.

72. FINAL LIMIT SWITCHES

In addition to the normal limit stops, a hoistway final limit switch shall be installed at the top and at the bottom of each hoistway as required by the ASA A17-1 Code. These final limit switches shall be operated by a fixed cam securely attached to the car. The switches shall be so located that they will be operated should the car travel a predetermined distance above or below the upper or lower terminal landing. These limit switches shall be independent of any other stopping devices, shall be positively opened without the use of springs and shall cut off all power from the motors and brakes and prevent the operation of the car in either direction.

Final limit switches shall be so located that they open at or about the time the buffer is engaged by the car or counterweight. Roller of switch shall engage on full area of cam surface. Final limit switches shall be through-bolted after the conclusion of the final acceptance tests. In addition, the Contractor shall install speed retarding devices as required to meet the runby limitations.

73. BUFFERS

Car oil buffers of the spring return type shall be provided in the pit and a similar buffer placed under the counterweight for each elevator except Elevator P-1, J-4, K-1, K-2 and No. 99 (in each Tower). The strokes of these buffers shall be such that the retardation, averaged over the entire working stroke shall not exceed 32.2 feet per second for the governor tripping speed. The maximum retardation based on governor tripping speed shall not be in excess of 80.5 feet per second.

The buffers shall have successfully passed the Engineering National Bureau of Standards tests or shall be certified to by an Authority approved testing laboratory to have met the test set forth in the ASA A-17-1 Code Such certification shall cover the range of speed and the load requirements for this installation. A metal plate marked with the name of manufacturer, type, stroke in inches, and range of speed and load for which same has been certified, shall be provided on all oil buffers.

Oil buffers shall be tested at the building in accordance with the requirements of the ASA A-17-1 Code.

The Contractor shall furnish and install all pipe standards, struts or other supports, braces, etc., for oil buffers. All details shall be subject to prior approval of the Engineer.

The Contractor shall include slow-down terminal switches as permitted by the applicable codes and ASA A17-1 Code to permit installation within the overhead and pit dimensions indicated on the Contract Drawings.

Spring type buffers shall be provided in the pit for both the car and counterweight of Elevator P-1, J-4, K-1, K-2 and No. 99 (in each Tower) in accordance with the requirements of the ASA A17-1 Code.

74. ELEVATOR ELECTRIC WIRING

All insulated wiring shall have a flame-retarding and moisture-resisting outer cover and shall be run in metal conduit, metallic tubing or wire ducts.

Traveling cables between cars and hoistways shall have flame-retarding and moisture-resisting outer cover. They shall be flexible and shall be suitably suspended to relieve strains in the individual conductors.

The Contractor shall provide 10 percent spare wires between each controller selector, hatchway junction box and starter's panel. He shall also provide 10 per cent spare conductors in each trail cable -- all spares to be properly tagged or otherwise identified with clear and indelible markings.

Traveling cables shall include shielded wires for each elevator as required for the intercommunication station in all cars and speakers in all cars.

Car lighting receptacles and fans shall be on individual circuits.

All wiring in troughs or raceways shall be kept free of concrete and wired in such a manner that each run may be readily traced from stud blocks to point of entry into the conduit.

Strain boxes shall be installed not over 6 floors apart.

No wire in excess of 18 inches in length shall be less than No. 18.

The size and number of conductors of the travel cable limit the voltage drop to less than 3 per cent.

All elevator indicator lamps except lanterns and signs shall be of the 115 volt type, operating on 55 volts.

Car lighting and car fan shall remain operative for a period of approximately five minutes when the motor generator automatically shuts down. The car lighting and car fan shall shut off immediately when the motor generator is shut down by means of a key switch.

All insulated wiring, control wiring and wiring in traveling cables shall be tag coded at their terminals in the Motor Room, shaft box, elevator cab junction box and pushbutton stations within the cab.

The Contractor shall provide two circuits from the shaft outlet box to each shuttle elevator.

The emergency stop switch in each car shall be connected to the alarm bell in a manner which will cause the bell to ring when the emergency stop switch is in the "On" position.

75. MACHINE LOCATION AND FOUNDATION (Elevators K-1 thru K-5, J-1 thru J-4, P-1 & 99

The elevator machines shall be located on the lower terminal floor level adjacent to the hoistway (except for Elevator P-1 which shall be located at Elevation 310 adjacent to the hoistway, Elevator K-2 which shall be located at Elevation 294, adjacent to the hoistway and Elevator No. 99 at 110th Floor upon a concrete foundation, or supporting steel (as indicated on the Contract Drawings), furnished in place under another contract. The Contractor shall provide heavy foundation bolts for incorporation in the foundation according to his template and these bolts, together with the necessary nuts and washers, shall permit the machine to be securely anchored in place.

76. OVERHEAD GRATING

The Contractor shall install perforated sheet steel grating over the area of the hoistway located directly under the overhead sheaves where indicated on the Contract Drawings. The grating shall rest on steel beams or channels and shall support a concentrated load of 300 pounds on any 4 square inches of the structure.

77. EMERGENCY EXIT CONTACTS

All side emergency exits, where required by Code, shall be provided with electric contacts to prevent the operation of the car with the exit doors open.

78. SOUND REDUCING

The Contractor shall provide necessary sound reducing materials, preferably rubber pads of proper density, to effectively isolate the motor generator set on below grade elevators from the machine beams or flooring. All rotating parts shall be properly balanced to eliminate vibration.

No conduit shall be fastened to or supported by the controller frame, starter frame or machinery except by flexible connections.

79. TELEPHONE PROVISIONS

Each elevator car shall be provided with a telephone compartment recessed in wainscot suitable to accommodate a dial-type telephone instrument.

The compartment shall be fitted with a solid hinged door panel of approved stainless steel design and equipped with a suitable latch. The upper portion of the door panel shall contain a glass or transparent plastic faced certificate frame, and the word "telephone" and car number shall be etched on the lower portion of the panel. The Contractor shall provide and install conduit in the car and flexible traveling cable connections required between the car and telephone outlet box in hoistway.

80. INTERCOMMUNICATION SYSTEM

In each elevator car the Contractor shall furnish and install a combination loudspeaker-microphone unit in the telephone cabinet. The cabinet shall be equipped with a grille which shall permit a passenger to answer calls from the loudspeaker-microphone unit, but not to originate calls; to signal the starter in an emergency, the person in the car shall be able to press an alarm bell button.

"The Contractor shall install one master station at the master control center locator at Elevation 264 between the North and South Tower. This master station shall have the ability to communicate with each elevator in each Tower, to each machine room in each Tower and to each starter's console (or other m mounting arrangements). At the Concourse Level, Zone II and Zone III starter's panel at the 44th and 78th floors, in each Tower respectively, the master control center master stations shall be equipped with a separate microphone and speaker combination unit for communication to the local elevators

(with their machine rooms and starter panel stations), shuttle elevators (including machine room station), and service elevators, (including machine room stations), for each Tower, (a total of six). The master station at the master control center shall be provided with distress lights for each elevator in both Towers, which will illuminate when the alarm bell in its respective elevator is pressed. Distress lights shall be of the latched-in-type. This master station shall be arranged for mounting in a console.

One master station shall be provided at the Concourse console (or other mounting arrangement), at the Zone II starter's panel mounting location at the 44th floor, and at the Zone III starter's panel mounting location at the 78th floor. These master stations shall have the ability to communicate with each elevator in its zone, to each machine room in its zone and to the master control center (Concourse master station shall have the ability to communicate with Zone I local elevators and all shuttle and freight elevators and their respective machine rooms). These master stations shall be equipped with distress lights for each elevator to which it is connected for communication, arranged to illuminate when the alarm bell in the respective elevator is pressed.

The Contractor shall install one master station in the starter's panel of Elevators K-3, K-4 and K-5 and Elevator J-1, J-2 and J-3 arranged to communicate to each elevator in its respective bank, to its machine room and to the master control room at Elevation 264. In addition, a master station shall be provided in the machine rooms of these two banks of elevators, which shall have the ability to communicate to each elevator in its respective bank, the starter's station in its bank and the master control center. The Elevators J-4, K-1, K-2 and P-1 shall connected to the master control panel, which shall be arranged to communicate with each elevator included in the Below Grade elevators through a separate loud-speaker-microphone unit. Distress lights, connected to the alarm bells of each

elevator, shall be provided for each elevator in the master control center, and in each master station located in the starter's control panels for the elevators in its bank.

Each machine room shall be equipped with a master station which shall have the ability to communicate to the following sub-stations:

Each elevator in its zone (i. e. each elevator which has driving machinery in the machine room).

The starters station master station at the Concourse or Skylobby floor.

The control center master station.

When the machine room for a bank of elevators is sub-divided (e.g. Shuttle Elevators 6 to 11) a separate station shall be provided for the auxiliary machine room. This station shall have the ability to communicate with the master station in the machine room for the remaining cars in the bank and to the elevators which have their driving machinery in the auxiliary machine room. Separate master stations shall be provided in the machine rooms for Shuttle Elevators 1 to 5, Shuttle Elevators 6 to 11, Shuttle Elevators 12 to 17 and Shuttle Elevators 18 to 23.

Each master station shall contain a microphone and speaker combination and selective buttons, by means of which a person at a master station may selectively connect his station to any of its substations for the purpose of issuing, or receiving replies or for monitoring sound.

Above the selective buttons of the master station, two knobs shall be mounted, one for adjusting volume and one for selecting "talk" or "listen". The listening circuit for each of the cars shall be so amplified that the master station may monitor all sound emanating from the elevator that is selected.

Amplifiers, as required, with approved type mounting arrangement, shall be provided for connection to the building wiring circuit

The intercommunication system shall be a quality system similar and equal to an approved "Executone System" as manufactured by Executone Inc., Queens, New York.

81. INSERTS

The Contractor shall furnish approved type inserts for installation by others where required to be set into walls for support of his equipment, guide rails, brackets, counterweights, etc. The Contractor shall properly locate inserts and will be held responsible for their correct positions, etc.

82. MACHINE FINISH AND PAINTING

After final adjustment of all machinery (except governors), iron work, metal fittings, etc., exposed in the hoistways or elsewhere, shall be painted with one shop priming coat and one coat in the field of a color selected by the Engineer. All exposed surfaces of machines, motors, etc., shall be painted at the factory with one coat of paint filler smoothed off and one coat of machine enamel of approved color. All machinery, cabinets, etc., shall be painted the same color and numbered as required by the ASA A17-1 Code. All surface holes and imperfections shall be filled with iron filler thoroughly rubbed in and smoothed off and on completion of the installation, the equipment shall be thoroughly cleaned and touched up as required, and given two additional coats of machine enamel and a coat of high-grade waterproof varnish.

83. EMERGENCY POWER ARRANGEMENTS

Each zone of Local and Freight or Shuttle elevators will be powered through two transfer switches installed by others. In general, one switch will serve even numbered elevators and the other odd numbered elevators within the same zone.

Control wiring from each transfer switch will be brought to a junction box in the related machine rooms by others as follows (3 wires):

Normal Operation: 480V (A to C) - B dead
Arrange to Sequence: (No Potentials) -A & B dead
Signal to Sequence: 480 V (B to C) - A dead

Control circuits shall be designed for fail safe operation and to prevent parallel connection of control sources. Sequence system test switches shall be installed by the Contractor in elevator machine rooms, one for each control circuit.

Sequencing of only those elevators effected by operation of its respective transfer switch shall be arranged without effecting normal operation of other elevators in same zone.

Upon return of normal power or initial start-up (480V -A to C established) a six (6) second time delay shall be provided between progressive starts of all even numbered elevators in the same zone (the same arrangement as detailed above will also be provided for all odd numbered elevators).

The Contractor shall furnish and install the necessary manual selector switches to provide one contract position for each local, shuttle and service elevator (one on "off" position) and the necessary auxiliary control equipment to permit selection of elevators for operation on emergency power at full rated car speed. The selector switches for the shuttle, Zone I, passenger elevators and freight elevators shall be located in the starter's console (or other arrangement) located in the console at Concourse Level in each Tower. The selector switches for the Zone II and Zone III elevators shall be included in their respective starter's panels. All the selector switches in both Towers shall be interlocked so that the maximum number of elevators in each Tower in operation at one time are as follows:

Arrangement No. 1 (Per Tower)

Elevator No. 50

One local elevator or one freight elevator in each zone.

One Zone II shuttle

One Zone III shuttle

Arrangement No. 2 (Per Tower)

Elevator No. 50

Shuttle Elevators 5, 6 and 17.

In addition to the Arrangement No. 1 and No. 2 detailed above, Below Grade Elevators shall be interlocked so that one Below Grade Elevator will operate at a time.

A wall outlet in each elevator machine room will provide normal and emergency power source for the intercommunication system.

Each starter panel containing a selector switch shall have two sets of two pilot lights each, one set for odd numbered elevators and the other set for even numbered elevators. One pilot light shall indicate that the respective elevators are operating on normal power and the other pilot light shall indicate the signal to start sequencing. This signal shall be accompanied by the momentary sounding of a bell or buzzer.

CHAPTER III
ESCALATORS

84. ESCALATOR OPERATION

The Contractor hereby assumes responsibility for designing and constructing the escalators so that they operate in accordance with the operational results provided for in the Specifications in their present form, without compensation in addition to the Sale price and the Work price and notwithstanding the fact that any design, method, Materials or equipment necessary for performing the Sale and the Work provided for in the Specifications and Contract Drawings are inadequate to accomplish such operational results or that the operational results are beyond the state of the art of escalator manufacture as of the date of execution of this Contract, and the Contractor shall at his own expense make such changes in the design, methods, Materials or equipment specified for performing the Sale and the Work and furnish and install such additions as may be necessary to accomplish the operational results provided for in the Specifications, subject to the approval of the Engineer.

85. ESCALATOR SCHEDULE AND REQUIREMENTS

The Contractor shall conform to the following escalator schedules and requirements:

BELOW GRADE

Escalator No. Escalator No.	Floors Served Floors Served	Rise Rise	Number of Units	Width
P-1 to P-10	Elev. 249.0 to Elev. 264.25	15 ft. 3 in.	10	48 in.
P-11 to P-18	Elev. 264.25 to Elev. 273.5	9 ft. 3 in.	8	48 in.
P-19 to P-27	Elev. 274.0 to Concourse (Elev. 310)	36 ft. 0 in	9	48 in.
K-1	Service Level (Elev. 294) and Concourse Level (Elev. 310)	16 ft. 0 in.	1	32 in.
K-2 & K-3	Elev. 284 to Elev. 294	10 ft. 0 in.	2	32 in.
	NORTH TOWER			
A-1 & A-2	Concourse (Elev. 310) to Plaza (Elev. 332)	22 ft. 0 in.	2	48 in.
A-3 & A-4	43rd Floor to 44th Floor (Skylobby)	14 ft. 0 in.	2	32 in.
A-5 & A-6	44th Floor (Skylobby) to 45th Floor	14 ft. 0 in.	2	32 in.

Escalator No.	Floors Served	Rise	Number of Units	Width
A-7 & A-8	77th Floor to 78th Floor (Skylobby)	12 ft. 0 in.	2	32 in.
A-9 & A-10	78th Floor (Skylobby) to 79th Floor	14 ft. 0 in.	2	32 in.
	SOUTH TOWER			
B-1 & B-2	Concourse (Elev. 310) to Plaza (Elev. 332)	22 ft. 0 in.	2	48 in.
B-3 & B-4	43rd Floor to 44th Floor (Skylobby)	12 ft. 0 in.	2	32 in.
B-5 & B-6	44th Floor (Skylobby) to 45th Floor	14 ft. 0 in.	2	32 in.
B-7 & B-8	77th Floor to 78th Floor (Skylobby)	12 ft. 0 in.	2	32 in.
B-9 & B-10	78th Floor (Skylobby) to 79th Floor	14 ft. 0 in.	2	32 in.

Speeds of all escalators shall be 90 feet per minute except Escalators No. A-3 and A-4 and P-1 thru P-27 which shall be arranged for two speed operation (90 feet per minute or 120 feet per minute). All escalators shall be of the cleat step, reversible, self-contained type, capable of operating under full load conditions in either direction, on an incline of 30 degrees from the horizontal, complete with driving machines, safety devices, and balustrade, all as specified hereinafter.

86. WORK BY OTHERS (ESCALATORS)

(1) Others will furnish and install loop electrical connections from the power main line switch to, but not connected to, the controller for each escalator, including wiring receptacles and outlets for illumination of interior of trusses and machine rooms.

(2) Others will supply electric power for starting, adjusting and testing machinery.

(3) Others will provide suitable floor openings, properly framed and finished in accordance with the Contract Drawings and provide in place all permanent enclosures railings, as required.

(4) Others will furnish and install supports of adequate strength, properly located, for trusses at upper and lower landings, including any required intermediate supports. This applies to all escalators.

(5) Others will place guards, during the time the escalators are being installed, around the floor openings, that may be required by law or for the convenience or protection of workmen and the general public, including, if necessary, barricades of suitable construction and with amply protected entrances.

(6) Rails around escalator well openings at each landing will be furnished in place by others.

(7) Covering for the exterior of truss and soffit will be furnished by others.

(8) Others will provide machine room space for the escalator machines for Escalators No. P-19 to P-27 directly below the upper end of each truss.

87. ESCALATOR CODE REQUIREMENTS

All parts and appurtenances of the escalators furnished and installed under these Specifications shall conform in every way to requirements of the Safety Code for Elevators, Dumbwaiters and Escalators by the American Standards Associates, A17-1 1965, including all revisions to date, and hereinafter referred to as ASA A17-1.

88. ESCALATOR MAINTENANCE

The Contractor shall furnish full maintenance on each individual escalator for a period of twelve (12) months after rendition of a Certificate of Partial Completion therefor in accordance with the Agreement between the parties dated August 15, 1967, entitled "Agreement to Perform Maintenance of Elevators and Escalators in North Tower Building, South Tower Building and Below Grade Levels of The World Trade Center", and at no cost to the Authority.

89. ESCALATOR GUARANTEE

The Contractor hereby unconditionally guarantees the Materials sold and the Work performed under this Contract against defects in Materials and workmanship and against failure to operate satisfactorily in accordance with the operational results called for in the Contract Drawings and Specifications in their present form for any reason whatsoever for a period of one year from the date of the rendition of the Certificate of Partial Completion applicable thereto, if any, or the Certificate of Final Completion of the Work, whichever date is earlier, other than defects or failures shown by the Contractor to the satisfaction of the Engineer to have arisen solely from abuse or accidents not contributed to by the Contractor or from affirmative, willful acts of the Authority occuring after execution of this Contract. The Contractor shall immediately make such adjustments, replacements and/or repairs as are necessary or desirable to remedy any conditions covered by this guarantee without separate or additional compensation therefor.

90. ESCALATOR ELECTRIC WIRING

The Contractor shall furnish and install the necessary insulated wiring to connect all parts of the equipment.

Insulated wiring shall have a flame retarding and moisture resisting outer cover and shall be run in metal conduit, metallic tubing or wire ducts.

91. TRUSS

Each structural steel truss shall be designed and constructed so as to safely carry the entire load of the escalator including all parts of same, together with the full capacity load and including the weight of the balustrade and truss covering as detailed on the Contract Drawings. The top end of the truss shall be arranged to carry the drive machine and controller. The truss shall have a factor of safety in accordance with the requirements of the ASA A-17-1 Code and other Codes having jurisdiction. The depth of the upper portion of the trusses shall not exceed 3 feet 11 inches in depth as measured from the upper floor level.

92. DRIP PANS

Drip pans of oil-tight construction shall be provided the entire length of each truss. Drip pans shall be capable of supporting a man's weight.

93. TRACKS

The tracks shall be constructed of drawn steel or other alloy, of proper rigidity and shall be so installed and supported as to insure perfect alignment and smooth operation of the running gear under all conditions. The distance between track support shall not exceed four feet. All tracks shall have a smooth finish track surface.

The carriages and curved tracks for guiding the steps at the upper and lower landings shall be provided with machined guiding surfaces, or formed from cold rolled steel bars. Curved chain wheel tracks at the upper landing shall be made easily removable and replaceable in a manner approved by the Engineer. The tracks at the lower landing shall be designed to accommodate the movement of the carriage unit.

Track system shall be "closed." Track system shall be smooth for continuous support of the chain wheels from sprocket to sprocket. The transition between incline and upper landing shall be accomplished by a curved track system with a minimum of 70 inch radius, except that this radius for Escalators No. P-19 to P-27 shall be a minimum of 12 feet 0 inches. The transition between incline and lower landing a minimum of 48 inch radius.

94. STEP DRIVE UNITS

. The top member of each step driving unit shall be carried on two brackets rigidly attached to the truss so as to insure and maintain proper alignment of the unit, and shall be removable intact from the truss.

. Suitable bearing shall be provided. Bearings shall be of the ball or roller type. They shall be dustproof and self-aligning and shall be provided with ample means for lubrication and adjustment for wear.

The chain sprockets of the step drive units shall be accurately machined to distribute the load evenly on the sprocket teeth and on the chair rollers and shall be designed for smooth operation.

The lower member of the step driving unit shall be mounted on supporting brackets or pedestals provided with rollers which operate on tracks located at each side of the truss and shall be designed and installed to automatically maintain proper tension on the step chains by means of either tension weights or compression springs. The unit shall be removable intact from the truss.

95. STEPS

Steps shall be of the horizontal tread formation. The vertical rise between steps shall not exceed 8-1/8 inches; the horizontal distance between the noses of the steps shall be not less than 15-3/4 inches and the clearance between steps shall not exceed 1/8 inch.

The step frames shall be made of steel suitably reinforced and braced to carry the step treads and the maximum load per step under eccentric loading conditions without distortion.

The step wheels shall be designed for quiet operation, must be of a type which will insure their rotation and prevent flat spots. They shall be so mounted as to prevent tilting and the rocking of the steps. They shall be provided with suitable bearings and provision made for their retention of ample lubricant to insure satisfactory operation without frequent lubrication.

The design of the steps and their various attachments shall be such as to permit the steps being readily removed without disturbing the balustrades or dismantling any part of the chains.

The design of the stairway shall be such as to permit running the chain without the steps for convenience in cleaning and inspection.

All exposed gearing, sprockets, and chains shall be covered with suitable guards. Side panels of guards shall be in sections of convenient size and readily removable in the opinion of the Engineer for purposes of inspection and maintenance.

96. STEP TREADS

The step treads shall be die cast white metal cleat type, designed to insure a secure foot-hold and comfortable tread surface; the cleats shall not exceed 1/8 inch in width; the grooves shall not exceed 1/4 inch in width, and shall be not less than 7/16 inch deep.

The treads shall have all square edges. Cleats shall be so spaced that the ends are flush with the step risers and those on the sides are located for minimum clearance with the adjustable curtain boards.

97. STEP CHAINS

The step chains shall be of the endless roller type, one located on each side of the step. The chains shall be made of high grade steel links with hardened pins and accurate rollers designed to accurately engage the drive sprockets to insure smooth operation. Provision shall be made to prevent sagging or buckling of the chains and to prevent the steps from coming in contact with each other and to also maintain substantially constant distances between step axles of all exposed steps. The step chain shall be provided with a tension device at the lower landing to maintain proper tension of the step chains as hereinbefore specified.

The chains shall have a factor of safety of not less than ten (10), and shall consist of hardened steel links throughout.

98. COMB PLATES

The comb plates shall have white metal surfaces, and have closely spaced comb teeth so arranged that the cleats of the step treads will pass between them with minimum clearance. The comb teeth shall be made in sections so that any damaged or worn section can be readily replaced without disturbing balance of comb. The comb teeth shall be formed to correspond to form of treads to obtain uniform side of clearance.

99. HANDRAILS

The handrail drive shall be of the traction or positive drive type and shall receive its motion from the main drive of the escalator to which it shall be connected so that the handrail will operate at the same speed and in the same direction as the escalator steps. All handrail wheels shall be provided with suitable bearings of grease sealed type or provided with ample means for lubrication.

The handrails shall be constructed of laminated canvas and neoprene or hypalon or colored rubber, or as approved by the Engineer, properly vulcanized or nylon inserts with molded rubber elbows. Canvas and rubber handrails shall be spliced and vulcanized to insure a strong and smooth splice, and shall operate on brass, bronze or steel guides, except when in contact with the driving sheaves.

The handrails, handrail wheels, and guides shall be so arranged that the handrail cannot be easily thrown off.

The extended newel shall be so designed and built that the handrail will disappear into the balustrading at a point difficult to reach.

100. DRIVING MACHINE AND LOCATION

Each driving machine shall be of the worm gear type, especially designed for escalator service, provided with accurately machined worm and gear driven by a moderate speed motor. Motors shall be designed to operate on 480 volt, 3 phase, 60 cycle electric current. The drive motor shall be equipped with a pulley with shoe type brake.

101. ESCALATOR CONTROLLER

Each controller shall be of the pushbutton operated, full magnetic, continuous duty and reversing type designed to protect the motor against overload. The Contractor shall provide suitable control transformers in each controller to reduce control voltage to 110 volt, 60 cycle for pushbutton and other control circuits.

102. LANDING AND FLOOR PLATES

Landing and floor plates shall be furnished by the Contractor to cover the entire area of the landing within the outline of the truss and shall be supported on the truss. The landing and floor plates shall be of cast aluminum, of a nonslip design and of required shapes and thickness as approved by the Engineer. Landing and floor plates shall be removable for access to the drive machines. Design of the landing and floor plates shall harmonize with the steps and comb plates.

103. BALUSTRADE AND STEP RISERS

The Contractor shall provide the deck covers and moldings, interior paneling, skirt panels and step risers, finished in stainless steel (unless otherwise specified) of a type and finish as approved by the Engineer.

104. TYPE OF BALUSTRADES

The balustrades for Escalators No. A-1 and A-2 and B-1 and B-2 shall be of the extended newel type consisting of glass panels, deck covers, skirt panels and moldings. The panels shall be constructed of laminated glass. Panels shall be set in metal moldings designed to eliminate vibration. Posts and glass stops shall be constructed of stainless steel.

The balustrades of the remaining escalators shall be constructed of stainless steel as approved by the Engineer and shall have approved type of acoustical treatment in the interiors for sound deadening purposes.

105. DECK COVERS AND MOLDINGS

The deck covers and moldings shall be constructed of stainless steel, and shall be not less than 14 gauge in thickness.

106. INTERIOR PANELS

a. The interior panels of all escalators, except No. A-1 and A-2 and B-1 and B-2, shall be made of wood and metal lamination cemented together or of stainless steel with sound deadening material applied to the back of each panel.

If these interior panels are made of wood and metal laminations cemented together, the panel shall be not less than 3/8 inch in thickness. Back of panels shall be galvanized sheet steel not less than 27 gauge. Exposed surfaces shall be stainless steel not less than 24 gauge, with butt joint construction.

If interior panels are made of stainless steel with sound deadening material applied to the back of panels, the stainless steel shall be not less than 18 gauge in thickness. Sound deadening material shall be of the rubberized type. Sound deadening material shall be fire resistant.

107. SKIRT PANELS

If the skirt panels are made of stainless steel with sound deadening material applied to the back of panels, the stainless steel shall be not less than 16 gauge. Sound deadening material shall be of the rubberized type and shall be fire resistant.

If skirt panels are made of wood and metal lamination cemented together, the panels shall be not less than 3/8 inch in thickness. Back of panels shall be galvanized sheet steel not less than 27 gauge. Exposed surfaces shall be stainless steel not less than 24 gauge.

108. STEP RISERS

Step risers shall be of the cleated type, that is, with vertical cleats arranged to engage with corresponding cleats in the back end of the step tread so as to form an interlocking unit and prevent the catching of overshoes between the edge of the step tread and the riser.

109. SAFETY DEVICES

The safety devices shall consist of a broken main drive chain device, step upthrust switches, overspeed governor, non-reversing device, safety brake, handrail safety guard, emergency stop buttons and such other safety devices as may be included in applicable safety codes.

110. STEP SKIRT SAFETY DEVICE

The Contractor shall furnish and install a step skirt safety device on each escalator. This device shall consist of safety switches so mounted alongside the steps that they will effectively stop the escalator should the steps be forced out of line due to the introduction of an object between the escalator and step riser at the top and bottom landings.

111. BROKEN STEP CHAIN DEVICE

The broken step chain safety device shall be provided with electric contacts which will be opened and cause the brake to be applied should either or both of the step chains break or should the tension on the chains drop below or exceed a predetermined value.

112. OVERSPEED GOVERNOR

The overspeed governor shall be designed to cut off the current supply to the motor and bring the escalator to rest, should it attain a speed in excess of 140 per cent of rated speed.

113. NONREVERSING DEVICE

The nonreversing device shall be designed to stop the escalator automatically should the direction of travel be accidentally reversed while the escalator is operating in ascending direction.

114. EMERGENCY STOP BUTTONS

The emergency stop buttons shall be located at top and bottom landings. and on the controller and shall be designed, on momentary pressure of either button, to cut off the current supply to the motor and bring the escalator to rest.

115. SAFETY BRAKE

The safety brake shall be of a type which is positive in operation and shall be brought into action each time the escalator is stopped, and shall automatically stop the escalator whenever the power is interrupted from any cause or by any of the safety devices, and shall hold the escalator stationary with full load. If the escalator shall be operated by main drive chain and

sprocket driving chains, a broken chain safety shall be provided which will set an emergency brake mounted on the upper sprocket shaft, and will stop the escalator. A ratchet and dog or clutch type shall be provided to prevent run in down direction.

116. LUBRICATION

Adequate lubrication facilities shall be provided by the Contractor and arranged for easy access by maintenance personnel.

117. PROTECTION

All exposed surfaces shall be covered with an approved type of covering that will withstand hard usage. Covering shall not be removed until so ordered by the Engineer.

118. CONTROL BUTTONS AND KEY SWITCHES

The Contractor shall provide suitable and approved type push-buttons and key operated switches at the ends of the upper and lower newels of the escalator to control the following:

a. The stopping of all motion of escalator -- pushbuttons (both at top and bottom).

b. The direction of travel of escalator -- key switches (at top and bottom).

c. The starting of escalator (at top and bottom).

d. The selection of high or low speed on two speed escalators (A-3, A-4 and P-1 to P-27)including key switches (at top and bottom).

All of the above buttons and key switches shall be located in the end of the extended newel at top and bottom as directed. Plates shall be of matching material, flush mounted, and suitably inscribed with letters, figures and direction arrows which are readily visible from a standing position. The comb plate, at the bottom and top of escalator shall contain a stop button and a key switch which will permit the operation of the escalator in either up or down direction. The stop button and the key switch shall be so

interconnected that the escalator must be brought to rest before the change of direction of travel or the change of high or low speeds can be made. Provisions shall be made in the emergency stop button for connection of an alarm bell and emergency signal system which will be provided under another contract.

The Contractor shall connect with approved type conduit and wiring all of the above buttons and switches to the controller which shall be located in the machine space at the top of escalator.

This Contractor shall provide ample lighting for maintenance personnel in the area of the oil pan under the step treads.

119. UPTHRUST SWITCHES

Upthrust safety switches shall be provided at each side of the lower landing. All switches shall be of the self-resetting type and the control circuits of the escalators shall be so arranged that after a safety switch is activated, it shall be impossible to start the escalator by the starting switch until the safety switch is reset.

120. COMB PLATE ILLUMINATION

Comb plate illumination shall be provided at the top and bottom landings of Escalators P-1 to P-27 inclusive. The comb plate illumination shall be in accordance with designs furnished by the Engineer and shall be located in the balustrade in both sides of each landing.

121. LANDING PLATE SAFETY SWITCHES

The Contractor shall provide landing plate safety switches on both the top and bottom landings of Escalators P-1 to P-27 inclusive.

122. STEP DEMARCATION LIGHTS

The Contractor shall provide step demarcation lights at the top and bottom of Escalators P-1 to P-27 inclusive. Lights shall consist of a light fixture which shall be installed directly below the track system and slightly ahead of the point where the steps enter or leave the comb plate. The fixtures shall be furnished with two fluorescent lamps which shall light up the full width of the step separation. The lighting shall be connected to the controller of each escalator in such manner that the lights will be illuminated only when the escalator is in operation.

123. STEP DEMARCATION

Each step tread of each escalator specified to be installed under the Contract shall be provided with a milled groove which shall be 3/32" wide by 3/32" deep and be located 5/8 inch from the front and back of each step tread for the full width of each tread.

124. HANDRAIL MOTION INDICATORS

Handrails shall have white markers uniformly spaced at approximately 2 foot centers which will be moulded into each handrail.

125. PLASTIC SIGNS

Plastic signs shall be installed on each escalator in accordance with the drawings to be furnished by the Engineer containing the words "Please Hold Handrail."

126. BROKEN HANDRAIL SWITCHES

Broken handrail switches shall be provided on Escalators P-1 to P-27 inclusive arranged in such a manner so as to stop the escalator when either handrail breaks.

127. INDICATOR DROP PANEL

An indicator drop panel shall be furnished and completely wired and installed which shall indicate the safety switch which stopped the escalator. The panels shall be located in the machine area of each escalator.

128. ANTI SLIDE DISCS

The Contractor shall install anti slide discs on the deck covers of Escalators P1- P-27. The discs shall be 3 inches in diameter by 3-1/4 inches high and shall have a No. 4 finish stainless steel. They shall be secured to the deck covers with consealed fasteners and spaced 4 foot on centers as directed by the Engineer.

129. SHOP FABRICATION

The various parts of each escalator shall be fabricated and assembled insofar as practical in the shop to minimize field assembly. Parts which cannot be shop-assembled but require close field fit shall be trial-assembled in the shop and given field erection marks where necessary to eliminate fitting work in the field.

130. SHOP PAINTING

Before shipment, all parts made of structural steel sections and plates shall be thoroughly cleaned to remove all loose mill scale, rust and foreign matter. Except where encased in concrete, all these parts shall be given one coat of a red lead base linseed oil paint, applied thoroughly and evenly and well worked into the joints and other open spaces. Parts that will be inaccessible after assembly shall be given two shop coats.

Machine finished surfaces shall be protected against corrosion by a coat of lead or tallow or other effective means as soon as the machining is completed.

All machinery and equipment shall be given the finish of the best quality normally used by the manufacturer of the machinery or equipment.

131. FINISHES

Samples of all exposed finishes shall be submitted to the Engineer for approval. Unless otherwise specified all stainless steel exposed to view

shall have a No. 4 finish. Exposed metal finishes of balustrades for Escalators A-1, A-2, B-1 and B-2 with the exception of the handrail and laminated glass interior panels shall be stainless steel with No. 7 finish. Skirt panels shall be stainless steel with No. 4 finish.

132. DECK FILLERS

Deck fillers between Escalators P-19 and P-20 and between Escalators P-25 and P-26 shall be installed as shown on Contract Drawing L-K-5 dated 6/15/67. The deck fillers shall be of stainless steel with a No. 4 finish.

133. SCHEDULE A - MAXIMUM SPACING FOR CAR AND COUNTERWEIGHT AND RAILS

BANK AND/OR ELEVATOR NO.	CAR BRACKET SPACING	CWT. BRACKET SPACING
Bank "A" 24-29	13'- 0"	14'- 0"
Bank "B" 30-35	14'- 0"	14'- 0"
Bank "C" 36-41	14'- 0"	14'- 0"
Bank "D" 42-47	14'- 0"	14'- 0"
Elev. 48	14'- 0"	14'- 0"
Bank "A" 51-56	14'- 0"	14'- 0"
Bank "B" 57-62	13'- 6"	14'- 0"
Bank "C" 63-68	13'- 0"	14'- 0"
Bank "D" 69-74	14'- 0"	14'- 0"
Elev. 49	12'- 0"	13'- 6"
Shuttles 1 to 5	14'- 0"	14'- 0"
8 to 11		
Shuttles 6 & 7	13'- 0"	14'- 0"
Bank "A" 75-80	13'- 6"	14'- 0"
Bank "B" 81-86	13'- 0"	14'- 0"
Bank "C" 87-92	12'- 6"	14'- 0"
Bank "D" 93-98	14'- 0"	14'- 0"
Elev. 50	14'- 0"	14'- 0"
Shuttles 12 to 23	14'- 0"	14'- 0"
Elev. 99	14'- 0"	14'- 0"

134. SCHEDULE B-CHARGES FOR HOISTING OF EQUIPMENT

Number To be Lifted Per Tower	Description of Item	Approximate Weight of Each Item (Pounds)	Floor Lifted To	Price Each
9	Zone 11 Shuttle Elevator Machines	60,000	47th	600.00
12	Zone 111 Shuttle Elevator Machines	60,000	81st	750.00
2	Combination Elevator Machines	60,000	110th	900.00

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THE PORT OF NEW YORK AUTHORITY

CONFORMED

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THE WORLD TRADE CENTER

CONTRACT WTC-320.00

ELEVATORS AND ESCALATORS

AUGUST 15, 1967

BOOK I

Note: Revised December 10, 1969 to incorporate WTC-326.00
AKS
SVW

Books II and III, separately bound booklets, also form part of this Contract.

THE PORT OF NEW YORK AUTHORITY

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TABLE OF CONTENTS

BOOK I — Page

PROPOSAL A-1

ACKNOWLEDGMENT A-3

FORM OF CONTRACT A-5

Chapter I - General Provisions

1. Definitions A-5
2. General Agreements A-8
3. Allowances - Elevator Car Enclosures and Entrances A-10
4. Unit Prices A-11
5. Authority Access to Records A-15
6. Exemptions from New York State and New York City Sales Taxes: Purchase of Materials A-15

Chapter II - Adjustments and Payments

7. Reduction of Prices A-17
8. Compensation for Extras A-19
9. Monthly Advances A-28
10. Final Payments A-29
11. Withholding of Payments A-31

Chapter III - Provisions Relating to Time

12. Times for Completion A-32
13. Extensions of Time A-41
14. Idle Salaried Men and Equipment A-43
15. Delays to Contractor A-44
16. Cancellation for Delay A-45
17. Escalation Due to Certain Causes. A-46

Chapter IV - Conduct of Contract

18. Authority of Director A-51
19. Authority and Duties of Engineer. A-52
20. Notice Requirements A-53
21. Minimum Wages. A-54
22. Equal Employment Opportunity A-55
23. Extra Orders. A-56
24. Title to Materials A-57
25. Assignments and Subcontracts A-58
26. Claims of Third Persons A-58
27. Certificates of Partial Completion (Escalators) A-58
28. Certificates of Partial Completion (Elevators) A-60

Page

29. Certificate of Completion of Sale A-62
30. Certificate of Completion of Work A-62
31. Certificate of Acceptance A-62

Chapter V - Warranties Made and Liabilities Assumed by the Contractor

32. Contractor's Warranties A-64
33. Rights of the City of New York. A-66
34. No Third Party Rights A-67
35. Waiver of Admiralty Rights A-67
36. Risk of Materials and Work Assumed by the Contractor. . . . A-67
37. Waiver by the Contractor, Subcontractors and Owners of Equipment A-68
38. Insurance Procured by Authority A-68

Chapter VI - Rights and Remedies

39. Rights and Remedies of Authority. A-73
40. Rights and Remedies of Contractor A-74
41. Performance of Contract as Agent for Contractor A-74
42. No Estoppel or Waiver A-75

Chapter VII - Miscellaneous

43. Submission to Jurisdiction A-76
44. Provisions of Law Deemed Inserted A-76
45. Invalid Clauses A-76
46. Non-liability of the Authority Representatives. A-77
47. Service of Notices on the Contractor. A-77
48. Modification of Contract A-77

SPECIFICATIONS

Chapter I - General Provisions

1. Construction Required by the Specifications B-1
2. Available Property and Contractor's Loading Diagrams. . . . B-5
3. Conditions and Precautions. B-6
4. Construction Scheduling and Control-Critical Path Method. . B-8
5. Operations of Others. B-12
6. Construction Personnel and Material Elevators B-13
7. Temporary Acceptance of Construction Elevators. B-15
8. Construction Hoists B-18
9. Contract Drawings B-19
10. Shop Drawings and Catalog Cuts and Brochures B-24
11. Workmanship and Materials B-27
12. Inspections and Rejections. B-30
13. Manufacturer's Certification B-31
14. Approvals by Engineers B-32
15. Errors and Discrepancies B-32

Page

16. Accidents and First Aid Provisions B-32
17. Safety and Sanitary Provisions B-33
18. Daily Progress, Equipment and Labor Reports B-33
19. Laws and Ordinances B-33
20. Identification B-34
21. Signs B-34
22. Contractor's Field Office and Representative. B-34
23. Surveys B-34
24. Temporary Structures. B-35
25. Utility Services. B-35
26. Permit and Requirements for Welding B-35
27. Final Inspection. B-36
28. Guarantees. B-36
29. Available Documents B-36

BOOK II Chapter II - Elevators

30. General C-1
31. Elevator Schedule and Requirements C-2
32. Elevator Car Enclosures C-30
33. Elevator Hoistway Entrances C-30
34. Work by Others (Elevators) C-31
35. Elevator Code Requirements. C-32
36. Elevator Maintenance. C-33
37. Elevator Guarantee. C-33
38. Logic System. C-34
39. Operation of Elevators
    A. Local Passenger Elevators C-37
    B. Shuttle Elevators C-39
    C. Freight Elevators 48, 49 and 50 . . . . . C-41
    D. Elevators P-1, K-2, and Elevator 99 in each Tower . . C-45
    E. Elevators J-4 and K-1 . . . . . C-47
    F. Special Operations. C-49
40. Group Supervisory Systems
    A. North and South Tower Local Passenger Elevators . . . C-58
    B. Special Provisions (North and South Tower Local Passenger Elevators). C-63
    C. Shuttle Elevators. C-64
    D. Below Grade Passenger Elevators C-70
41. Car Operating Device - Local Passenger Elevators - North and South Tower Elevators (Except Elevator 99) and Elevators J-1, J-2, J-3, K-3, K-4 and K-5 . . . . . C-73
42. Starter's Control Panels - North and South Tower Local Passenger Elevator Banks, Below Grade Banks - (Bank 1 - Elevators J-1, J-2, J-3; Bank 2 - Elevators K-3, K-4 and K-5) C-75
43. Starter's Indicator Panel - North and South Tower Local Passenger Elevator Banks and Below Grade Banks - (Bank 1 - Elevators J-1, J-2 and J-3; Bank 2 - Elevators K-3, K-4 and K-5) C-76
44. Starter's Panel for Shuttle Elevators and Freight Elevators No. 48 to 50. . . . . C-77

		Page
45.	Gearless Hoisting Machines.	C-78
46.	Worm-Geared Machines.	C-79
47.	Guide Rails	C-80
48.	Control System	C-82
49.	Elevator Controller	C-84
50.	Car and Counterweight Guides.	C-84
51.	Counterweights	C-85
52.	Car Frames, Safeties and Governors	C-85
53.	Hoisting and Governor Cables.	C-87
54.	Compensating Ropes.	C-87
55.	Hoistway Door Hangers and Tracks.	C-88
56.	Car and Hoistway Door Operation	C-88
57.	Inspection and Maintenance Switches	C-90
58.	Electric Interlocks and Door Contacts	C-90
59.	Door Reversal Device.	C-91
60.	Door Detecting Device	C-92
61.	Automatic Self-Leveling	C-93
62.	Hoisting Motor (Below Grade Elevators and Elevator No. 99 in each Tower).	C-93
63.	Car Platforms	C-94
64.	Fixture Faceplates	C-94
65.	Hall Lanterns	C-95
66.	Corridor Hall Button Fixtures	C-95
67.	Car Progress Indicators	C-96
68.	Car Position Indicators	C-96
69.	Elevator Appurtenance Designs	C-97
70.	Work Lights and Receptacles	C-98
71.	Normal Stopping Devices	C-98
72.	Final Limit Switches.	C-98
73.	Buffers	C-99
74.	Elevator Electric Wiring.	C-100
75.	Machine Location and Foundation (Elevators K-1 thru K-5, J-1 thru J-4, P-1 & 99)	C-101
76.	Overhead Grating.	C-101
77.	Emergency Exit Contacts	C-101
78.	Sound Reducing	C-101
79.	Telephone Provisions.	C-102
80.	Intercommunication System	C-102
81.	Inserts	C-105
82.	Machine Finish and Painting	C-105
83.	Emergency Power Arrangements.	C-105

Chapter III - Escalators

84.	Escalator Operation	D-1
85.	Escalator Schedule and Requirements	D-2
86.	Work by Others (Escalators).	D-3
87.	Escalator Code Requirements	D-4
88.	Escalator Maintenance	D-5
89.	Escalator Guarantee	D-6

		Page
90.	Escalator Electric Wiring	D-7
91.	Truss	D-7
92.	Drip Pans	D-7
93.	Tracks	D-8
94.	Step Drive Units	D-8
95.	Steps	D-9
96.	Step Treads	D-10
97.	Step Chains	D-10
98.	Comb Plates	D-10
99.	Handrails	D-11
100.	Driving Machine and Location	D-11
101.	Escalator Controller	D-11
102.	Landing and Floor Plates	D-12
103.	Balustrade and Step Risers	D-12
104.	Type of Balustrades	D-12
105.	Deck Covers and Moldings	D-12
106.	Interior Panels	D-12
107.	Skirt Panels	D-13
108.	Step Risers	D-13
109.	Safety Devices	D-13
110.	Step Skirt Safety Device	D-14
111.	Broken Step Chain Device	D-14
112.	Overspeed Governor	D-14
113.	Nonreversing Device	D-14
114.	Emergency Stop Buttons	D-14
115.	Safety Brake	D-14
116.	Lubrication	D-15
117.	Protection	D-15
118.	Control Buttons and Key Switches	D-15
119.	Upthrust Switches	D-16
120.	Comb Plate Illumination	D-16
121.	Landing Plate Safety Switches	D-16
122.	Step Demarcation Lights	D-17
123.	Step Demarcation	D-17
124.	Handrail Motion Indictors	D-17
125.	Plastic Signs	D-17
126.	Broken Handrail Switches	D-17
127.	Indicator Drop Panel	D-17
128.	Anti Slide Discs	D-18
129.	Shop Fabrication	D-18
130.	Shop Painting	D-18
131.	Finishes	D-18
132.	Deck Fillers	D-19
133.	SCHEDULE A - Maximum Spacing for Car and Counterweight and Rails	E-1
134.	SCHEDULE B - Charges for Hoisting of Equipment	E-2

BOOK III

ADDENDUM NO. 3, April 1, 1968 (2 pages)

Chapter IV - Elevator Car Enclosures

		Page
135.	Materials.	F-1
136.	Elevator Car Enclosure Construction.	F-4
137.	Local Passenger Elevators.	F-6
138.	Shuttle Elevators and Shuttle Combination Elevators (C.E.)	F-9
139.	Freight Elevators.	F-12
140.	Certificate, Car Identity and Car Capacity Frames.	F-15
141.	Elevator Car Enclosure Protection Pads	F-16
142.	Finishes	F-16
143.	Workmanship.	F-19

Chapter V - Elevator Hoistway Entrances

144.	Materials	G-1
145.	Elevator Hoistway Entrances	G-2
146.	Sub-Assemblies	G-7
147.	Hoistway Entrance Door Frames	G-9
148.	Hoistway Doors and Transoms	G-11
149.	Hoistway Enclosure Fixed Wall Panels.	G-14
150.	Hoistway Door Sills	G-15
151.	Dummy Entrances	G-16
152.	Finishes	G-16
153.	Mock-Up	G-17
154.	Workmanship	G-18

BILLING SCHEDULES FOR CPM H-1

PROPOSED NEW YORK CITY BUILDING DEPARTMENT CODE - ARTICLE 18 - ELEVATORS AND CONVEYORS - MAY 1, 1967

THE PORT OF NEW YORK AUTHORITY
111 Eighth Avenue - at 15th Street, New York, N.Y. 10011

World Trade Department

Guy F. Tozzoli, Director Telephone (212) 620-8171

May 1[illegible], 19[illegible]

Otis Elevator Company
250 Eleventh Avenue
New York, New York 10001

Re: The World Trade Center - Elevators and Escalators - Contract WTC-320.00 - Elevator Car Enclosures and Hoistway Entrances - Contract WTC-326.00

Gentlemen:

The Port of New York Authority hereby accepts your Proposal for furnishing elevator car enclosures and furnishing and installing elevator hoistway entrances (Alternate L) for Towers A and B and for the areas below the Plaza west of Greenwich Street of the World Trade Center dated March 8, 1968, as amended by letter dated March 11, 1968, such acceptance, however, being subject to your indicating concurrence in the understandings set forth herein by promptly executing and returning the enclosed copy of this letter.

1. The Sale Price is $[illegible] and the Work Price is $[illegible]. Since such furnishing and installation is being performed under the provisions of Contract WTC-320.00 (with the exceptions referred to in paragraph 2 below) after taking into account the allowances for the elevator car enclosures and entrances, this results in an increase in the Sale Price and Work Price under Contract WTC-320.00 to $25,714, [illegible] respectively.

2. The following provisions included in your Proposal are applicable to the subject enclosures and entrances in lieu of the similar provisions in Contract WTC-320.00:

(a) [illegible] "Allocation of Prices".

(b) Portions of clause entitled "Compensation for Extras" and "Monthly Advances" appearing on pp. 49, 50, 50A, 51, 52, 53 and 54 except that Item 13 on page 50 is hereby deleted.

3. Addendum No. 3 dated April 1, 1968 is hereby made a part hereof and the clause of your Proposal entitled "Price Reductions" is hereby deleted.

4. In the Proposal, subparagraph (b) of clause 2 under the heading "Applicable Documents and Provisions" is hereby deleted and the Contract agrees that the completion date for installation of each elevator entrance and for furnishing of each elevator car enclosure shall be the date specified for completion of the elevator of the same number under Contract WTC-320.00 in the chapter thereof entitled "Provisions Relating to Time" and shall be subject to all the provisions of said chapter.

We trust the foregoing meets with your approval and shall deem Contract WTC-320.00 amended to include the above upon receipt of an executed copy of this letter.

Very truly yours,

THE PORT OF NEW YORK AUTHORITY

Guy F. Tozzoli, Director
World Trade Department

CONCURRED AND ACCEPTED:
OTIS ELEVATOR COMPANY

By _____

Title REGIONAL VICE PRESIDENT

Date 5-31-68

PROPOSAL

To The Port of New York Authority:

The undersigned (*) Otis Elevator Company, a corporation organized under the laws of the State of New Jersey, hereby offers to perform all the obligations and to assume all the duties and liabilities of the Contractor provided for in the attached Form of Contract, at the prices inserted by the undersigned in the clause of said Form of Contract entitled "General Agreements."

This offer shall be irrevocable prior to September 1, 1967.

To induce the acceptance of this Proposal, the undersigned hereby makes each and every representation and warranty made by the Contractor in said Form of Contract. Moreover as a condition to receipt and consideration by the Authority of the Proposal whether or not it is accepted, the undersigned agrees that all information of any nature whatsoever, regardless of the form of the communication, received from the undersigned (including its officers, agents or employees) by the Authority, its Commissioners, officers, agents, employees, consultants or contractors, and notwithstanding any statement therein to the contrary, has not been given in confidence and may be used or disclosed by or on behalf of the Authority without liability of any kind except as may arise under letters patent of the undersigned, if any.

The attached Form of Contract and all papers made part thereof by its terms are made part of this Proposal.

The undersigned hereby designates the following as his office (**):

260 Eleventh Avenue
New York, New York 10001

(*) Insert bidder's name. If a corporation, give the state of incorporation, using the phrase, "a corporation organized under the laws of ." If a partnership, give full names of partners, using also the phrase, "co-partners doing business under the firm name of ." If an individual using a trade name, give individual name, using also the phrase, "an individual doing business under the trade name of ."

(**) Insert office address

CAUTION: Sign in both places on next page.

The telephone number of the undersigned CH4 8000

Dated, August 29, 1967

(Name of corporation or partnership or signature of individual) → Otis Elevator Co.

(Signature of corporate officer, partner or agent of individual) → By (*) F. P. Wingate

F.P. Wingate
Regional Vice President

19 Stonewall Lane

Mamaroneck, New York

(Acknowledgment of signature to be taken on proper form on following page)

The undersigned further assures the Port of New York Authority that the foregoing offer is irrevocable prior to September 1, 1967.

(Signature of agent, partner or corporate officer signing above) F. P. Wingate

F.P. Wingate

CERTIFICATE OF AUTHORITY, IF BIDDER IS A CORPORATION

I, the undersigned, Asst. Secretary of the corporation submitting the foregoing Proposal, hereby certify that under and pursuant to the by-laws and resolutions of said corporation, each officer who has signed said Proposal on behalf of the corporation, including the foregoing assurance of irrevocability, is fully and completely authorized so to do.

(Corporate Seal) T. W. Gould

T.W. Gould Asst. Sec.

(*) If Proposal is signed by an officer or agent, give title and address.

ACKNOWLEDGMENT OF BIDDER,
IF A CORPORATION

State of..New.York.....,)
) SS.:
County of.New.York.....,)

On this.....29th.....day of.....August....., 1967, before me personally came and appeared..F.P..Wingate....., to me known, who, being by me duly sworn, did depose and say that he resides at.19.Stonewall.Lane,.Mamaroneck,.New.York....., that he is the Regional.Vice.President.....of.Otis.Elevator.Co....., the corporation described in and which executed the foregoing instrument; that he knows the seal of said corporation; that one of the seals affixed to said instrument is such seal; that it was so affixed by order of the directors of said corporation; and that he signed his name thereto by like order.

(Seal) .....Anthony.S..Leidner.....

ACKNOWLEDGMENT OF BIDDER,
IF A PARTNERSHIP

State of.....,)
) SS.:
County of.....,)

On this.....day of....., 196 , before me personally came and appeared....., to me known and known to me to be one of the members of the firm of..... ....., described in and who executed the foregoing instrument and he acknowledged to me that he executed the same as and for the act and deed of said firm.

(Seal) .....

ACKNOWLEDGMENT OF BIDDER,
IF AN INDIVIDUAL

State of.....,)
) SS.:
County of.....,)

On this.....day of....., 196 , before me personally came and appeared..... .....to me known and known to me to be the person described in and who executed the foregoing instrument and he acknowledged to me that he executed the same.

(Seal) .....

CONTRACT WTC-320.00

STATEMENT ACCOMPANYING PROPOSAL

Names and Residences of Officers, If Bidder is a Corporation

Name	Title	Residence (*)
F.S. Dunn	Pres.	14 W. 10th Street, New York City
R.C. Olson	Exec. V.P.	Sands Light Rd., Sands Point, L.I.
F.R. Fardwell	Sec. Treas.	26 E. 10th Street, New York City

Names and Residences of Partners, If Bidder is a Partnership

Name	General or Limited Partner	Residence (*)

Bidder's Residence, If an Individual (*)

If Bidder is a Corporation, Annex Copy of Certificate of Incorporation Certified by Corporate Secretary.

(*) Give Street and Number of Residence. Do not give business address.

FORM OF CONTRACT

CHAPTER I

GENERAL PROVISIONS

1. DEFINITIONS

To avoid undue repetition, the following terms whenever they occur in this Form of Contract or any of the other papers forming a part of the Contract shall be construed as follows:

"Contract" shall mean, in addition to this Form of Contract, the Proposal, the Authority's acceptance, the Specifications and the Contract Drawings, all of which are made part hereof as though herein set forth in full. This booklet supersedes all prior proposals, documents, discussions, correspondence and agreements respecting The World Trade Center and the entire agreement between the parties shall consist only of the Contract as so defined.

The term "days" or "calendar days" in reference to a period of time shall mean consecutive calendar days, Saturdays, Sundays and holidays included.

The term "construction site" or words of similar import shall mean the area bounded on the west by the U.S. Pierhead Line, on the north by the north street line of Vesey Street, on the east by the east street line of Church Street and on the south by the south street line of Liberty Street in The City of New York and the vicinity of such area.

"Sale" and words of similar import shall mean the furnishing (including delivery and unloading at the construction site) of all permanent Materials (hereinafter referred to as "Materials") which are necessary or proper for or incidental to elevators, including elevators to be used during actual construction, and escalators and the installation of elevator car enclosures and, unless the Authority exercises the option contained on page A-10 hereof, the furnishing of elevator car enclosures and the furnishing and installation of hoistway entrances, all for the North (Tower A) and South (Tower B) Tower Buildings and for the areas below the Plaza west of Greenwich Street including the PATH underpass, all at the construction site.

"Work" and words of similar import shall mean all structures, equipment, plant, labor, materials (other than Materials sold to the Authority under this Contract) and other facilities and all other things which are necessary or proper for or incidental to the installation of elevators, including elevators to be used during actual construction, and escalators, and the installation of elevator car enclosures and, unless the Authority exercises the option contained on page A-10 hereof, the installation of hoistway entrances, all for the North (Tower A) and South (Tower B) Tower Buildings and for the areas below the Plaza west of Greenwich Street including the PATH underpass, all at the construction site.

"Performance of the Contract" or "arising out of or in connection with the Contract" and words of similar import shall mean the performance of the Sale or the Work or arising out of or in connection with the Sale or the Work.

"Sale Price" shall mean the lump sum Sale Price quoted in Part A of the clause hereof entitled "General Agreements."

"Work Price" shall mean the lump sum price for the Work quoted in Part B of the clause hereof entitled "General Agreements."

"Materials required by the Contract Drawings and Specification in their present form" or "Work required by the Contract Drawings and Specifications in their present form" or words of similar import shall include all Materials or Work required by the Specifications in their present form (whether or not shown upon the Contract Drawings), all Materials or Work shown upon the Contract Drawings in their present form (whether or not mentioned in the Specifications) and all Materials of Work involved in or incidental to the accomplishment of the results intended by the Specifications and Contract Drawings in their present form (whether or not mentioned therein or shown thereon).

"Extra Materials" or "Extra Work" shall mean Materials or Work required by the Director or Chief of Planning and Construction acting personally pursuant to the Clause entitled "Extra Orders" which are in addition to those required by the Contract Drawings and Specifications in their present form.

"Contract Drawings" shall mean the Contract Drawings designated in the clause of the Specifications entitled "Contract Drawings" listed on pages B-19 thru B-23 inclusive and except as used in the phrase "Contract Drawings in their present form", shall include any future alterations and revisions of said drawings, subject to all the other provisions of this Contract.

"Director" shall mean the Director of the World Trade Department of the Authority for the time being, or his successor in duties, acting personally or through his authorized representative, who is at present the Deputy Director of the World Trade Department of the Authority.

"Engineer" shall mean the Chief of the Planning and Construction Division of The World Trade Center of the World Trade Department of the Authority for the time being, or his successor in duties, acting personally or through his authorized representative, except where provided herein to be acting personally, who is the Construction Manager of The World Trade Center, except that the Construction Manager is not authorized to render Certificates of Partial Completion, Certificates of Completion or the certificates of total compensation earned, or to extend the time for completion of any part of the Contract.

The terms "Contractor for Contract WTC-320.00" and "Contract No. WTC-320.00" shall mean respectively: "this Contractor" and "this Contract".

"Inspector" shall mean any representative of the Engineer designated by him as Inspector and acting within the scope of the particular authority vested in him.

The term "permanent construction" shall include all construction installation, structures, equipment and materials to be constructed, installed or left by the Contractor at or about the construction site (or elsewhere in the possession of the Authority) after the completion of the Contract (whether or not they are yet delivered or installed), even though they are subsequently to be removed by others. The terms "permanent installation", "permanent structure", "permanent materials", and words of similar import shall have the same meaning as the term "permanent construction".

"Materialman" shall mean anyone who furnishes materials, plant or equipment to the Contractor or any subcontractor in the performance of the Contract.

"Subcontractor" shall mean anyone who performs Work (other than or in addition to the furnishing of materials, plant or equipment) at or about the construction site, directly or indirectly for or in behalf of the Contractor (and whether or not in privity of contract with the Contractor), but shall not include any person who furnishes merely his own personal labor or his own personal services.

"Materialman" or "subcontractor", however, shall exclude the Contractor or any subsidiary or parent of the Contractor or any person, firm or corporation which has a substantial interest in the Contractor or in which the Contractor has a substantial interest; provided, however, that for the purpose of the clause hereof entitled "Assignments and Subcontracts" the exclusion in the paragraph shall not apply to any one but the Contractor himself.

"Workingman" or "workman" shall mean any employee of the Contractor or of a subcontractor who performs personal labor or personal services at the construction site.

"Notice" shall mean a written notice.

Whenever they refer to the Sale or Work or its performance, "directed", "required", "permitted", "ordered", "designated", "prescribed", and words of similar import shall mean directed, required, permitted, ordered, designated or prescribed by the Engineer; and "approved", acceptable", "satisfactory" and words of similar import shall mean approved by or acceptable or satisfactory to the Engineer; and "necessary", "reasonable", "proper", "correct" and words of similar import shall mean necessary, reasonable, proper or correct in the judgment of the Engineer.

Whenever "including", "such as" or words of similar import are used, the specific things thereafter enumerated shall not limit the generality of the things preceding such words.

Whenever reference is made to the date of the opening of Proposals or receipt of bids, such reference shall be deemed to mean the date of receipt by the Authority of the Contractor's Proposal on this Contract set forth on pages A-1 and A-2 herein.

2. GENERAL AGREEMENTS

A. Agreement of Sale (Furnishing Materials)

The Contractor agrees to sell and the Authority agrees to purchase the permanent Materials necessary or proper for or incidental to the elevators, including elevators to be used during actual construction, and escalators and the installation of elevator car enclosures and, unless the Authority exercises the option contained on page A-10 hereof, the furnishing of elevator car enclosures and the furnishing and installation of hoistway entrances, all for the North (Tower A) and South (Tower B) Tower Buildings and for the areas below the Plaza west of Greenwich Street including the PATH underpass, all at the construction site.

For the furnishing of said Materials (including performance of all the Contractor's duties and obligations relating to said Sale under this Contract), the Authority agrees to pay to the Contractor and the Contractor agrees to accept from the Authority, as full consideration, the following compensation, and such compensation only, subject only to the express provisions of this Contract specifically setting forth actual, defined additions to or deductions from such compensation:

The lump sum SALE PRICE of Twenty Five Million Seven Hundred

(Price for furnishing materials) Fourteen Thousand Six Hundred Sixty Dollars and NO Cents ($25,714,660.00) (SEE NOTES 1 AND 2)

B. Agreement to Perform Work (Installation)

The Contractor agrees to install elevators, including elevators to be used during actual construction, escalators, elevator car enclosures and, unless the Authority exercises the option contained on page A-10 hereof, hoistway entrances, all for the North (Tower A) and South (Tower B) Tower Buildings and for the areas below the Plaza west of Greenwich Street including the PATH underpass, all at the construction site.

Except for the Materials included in the above Agreement of Sale, the Contractor agrees to furnish all structures, equipment, plant, labor, materials, and other facilities and to do all other things necessary or proper for or incidental to the foregoing Work. The Materials included in the above Agreement of Sale shall be furnished by the Authority to the Contractor, without charge, for use in the performance of said Work.

For the performance of said Work (including the performance of all the Contractor's duties and obligations relating to said Work under this Contract), the Authority agrees to pay to the Contractor and the Contractor agrees to accept from the Authority, as full consideration, the following compensation, and such compensation only, subject only to the express provisions of this Contract specifically setting forth actual, defined additions to or deductions from compensation:

The lump sum WORK PRICE of Nine Million Nine Hundred Fifty Four

(Prices for installation) Thousand Three Hundred Twenty Eight Dollars and NO Cents ($9,954,328.00) (SEE NOTE 2)

Note 1. For tax exemptions, see the clause, entitled "Exemptions from New York State and New York City Sales Taxes: Purchase of Materials."

Note 2. The SALE PRICE and the WORK PRICE are mutually exclusive, and each will be separately payable in addition to the other.

C. Sale and Work

Said Sale and Work shall be performed in strict accordance with the Contract Drawings and Specifications and any future changes therein and shall include the performance by the Contractor of all designing necessary or desirable for the operation of elevators, and escalators and the installation of elevator car enclosures and, unless the Authority exercises the option contained on page A-10 hereof, the furnishing of elevator car enclosures and the furnishing and installation of hoistway entrances; and the Contractor further agrees to assume and perform all other duties and obligations imposed upon him by this Contract. Such other duties and obligations, as well as any rights, duties, obligations and liability assumed by or imposed on the Authority, shall be deemed a part of either the Sale or the Work, whichever may be appropriate.

The above Sale Price plus the above Work Price shall be the total compensation to which the Contractor shall be entitled under this entire Contract, subject only to the express provisions of this Contract specifically setting forth actual, defined additions to or deductions from such compensation. The enumeration in this Form of Contract and in the Specifications of particular things to be furnished or done at the Contractor's expense, or without cost or expense to the Authority, or without additional compensation to the Contractor shall not be deemed to imply that only things of a nature similar to those enumerated shall be so furnished and done, but the Contractor shall furnish all Materials and perform all Work as required, without other compensation than that specifically provided in this Contract, whatsoever changes may be made in the Contract Drawings and Specifications, whatsoever Materials and Work may be required in addition to that required by the Contract Drawings and Specifications in their present form, and whatsoever obstacles or unforeseen conditions may arise or be encountered.

3. ALLOWANCES - ELEVATOR CAR ENCLOSURES AND ENTRANCES

	Sale	Work
Elevator Car Enclosures	$ 804,000.00	
Elevator Hoistway Entrances	$ 719,530.00	$ 308,370.00

Total $ 1,831,900.00

The furnishing of elevator car enclosures and the furnishing and installation of elevator hoistway entrances shall be performed subject to the provisions of this Contract and in accordance with Contract Drawings and Specifications therefor to be prepared by the Authority and submitted to the Contractor on or before January 1, 1968. Within thirty days after receipt of the aforementioned Contract Drawings and Specifications, the Contractor shall notify the Director in writing as to his price for furnishing the elevator car enclosures and his prices for furnishing and installing the elevator hoistway entrances.

The Authority shall have the option* of accepting the Contractor's prices or purchasing the elevator car enclosures and purchasing and having installed the elevator hoistway entrances under a separate contract or contracts with others. It is understood that said option may be exercised either in regard to the furnishing of the elevator car enclosures or the furnishing and installation of the elevator hoistway entrances, or both. Said option shall only be exercised in a writing signed by the Director and mailed to the Contractor within thirty days after receipt of the Contractor's prices.

In the event that the Authority elects to purchase only the elevator car enclosures under this Contract or only purchase and have installed the elevator hoistway entrances under this Contract, the Authority will deduct the applicable above quoted amount or amounts, as the case may be, for the portion to be purchased from others from the Contract Sale price or Work price, or both, as the case may be, as set forth in the clause hereof entitled "General Agreements".

In the event that the Authority elects to purchase the elevator car enclosures and purchase and have installed the elevator hoistway entrances under a separate contract or contracts with others, the Authority will deduct the above quoted amounts from the Contract Sale price and Work price as set forth in the clause hereof entitles "General Agreements"; provided, however, that the Contractor shall install the elevator car enclosures which will be furnished by others without separate or additional compensation therefor. In the event that the elevator hoistway entrances are to be furnished and installed by others, it is presently expected, but not guaranteed, that such will be furnished and installed on or before January 15, 1969. In the event that the elevator car enclosures are to be furnished by others, it is presently expected, but not guaranteed, that such will be furnished to the Contractor for installation on or before July 1, 1969. However, such dates may be extended for various reasons including if for any reason the Contractor delays in submitting its prices to the Authority.

* The option was exercised by letter dated May 15, 1968 and is reflected in this conformed book.

4. UNIT PRICES

A. In the event that prior to July 1, 1969 the Director orders the Extra Materials and Extra Work described below, the Contractor agrees that such Extra Materials shall be furnished and such Extra Work shall be performed in accordance with all the provisions of this Contract and the orders of the Director and Engineer and that in lieu of the compensation provided for in the clause hereof entitled "Compensation for Extras" the Contractor shall accept the following amounts as full compensation therefor:

a. Prices for dropping a local elevator into the local zone to create a cross-over floor.

Sale	Work	Total	
2862(1)	2226	5088	
$4134(2)	$2226	$6360	per Bank (average)

b. Prices for an additional temporary construction car.

Sale	Work	Total	
$ -	$8654	$8654	per Car (Zone II Shuttle)
$ -	$11538	$11538	per Car (Zone III Shuttle)
$ -	$6002	$6002	per Car (Local)

c. Prices for adding an additional freight elevator opening @ front.

Sale	Work	Total	
412(1)	420	832	
$620(2)	$420	$1040	per Opening (within rise)
895(1)	789	1684	
$1316(2)	$789	$2105	per Opening (additional rise)

(1) Prices for changes before fabrication begins.
(2) Prices for changes after fabrication begins and before material is shipped.

d. Prices for adding a stop for a shuttle elevator.

Sale	Work	Total	
548(1)	449	997	
$ 797(2)	$ 449	$1246	per Stop (First car)
471(1)	231	702	
$ 589(2)	$ 231	$ 820	per Stop (each additional car)

e. Price for furnishing and installing a hall lantern in accordance with the design shown on Contract Drawing L-AB-1 in lieu of the Contractor's standard hall lantern.

Sale	Work	Total
$5	-	$5

f. Price for furnishing and installing a corridor hall button fixture in accordance with the design shown on Contract Drawing L-AB-1 in lieu of the Contractor's standard hall button fixture.

Sale	Work	Total
$38	-	$38

g. Prices for extending a shaft up.

Sale	Work	Total	
See Item C Pg. A-11 (Add'l. Rise)(1)			
See Item C Pg.A-11 $_____(2)		$_____	per Floor (freight)
1160(1)	890	2050	
$1673(2)	$890	$2563	per Floor (first car-local)
880(1)	713	1593	
$1278(2)	$713	$1991	per Floor (each additional-local)

h. Prices for prestressed hoist cables.

Sale	Work	Total
$ -	$ -	$No charge per Car

(1) Prices for changes before fabrication begins.
(2) Prices for changes after fabrication begins and before material is shipped.

i. Prices for reroping

Locals Zone I	Sale	Work	Total
Bank A	$ 927	$ 744	$1671
B	$1297	$ 744	$2041
C	$1921	$ 744	$2665
D	$2347	$ 744	$3091

Locals Zone II	Sale	Work	Total
Bank A	$ 811	$ 744	$1555
B	$ 978	$ 744	$1722
C	$1275	$ 744	$2019
D	$1578	$ 744	$2322

Locals Zone III	Sale	Work	Total
Bank A	$ 714	$ 744	$1458
B	$ 886	$ 744	$1630
C	$1209	$ 744	$1953
D	$1547	$ 744	$2291

Shuttles Zone II	Sale	Work	Total
1 to 5	$4567	$1624	$6191
6 & 7	$13587	$3653	$17240
8 to 11	$4545	$1624	$6169

Shuttles Zone III	Sale	Work	Total
12 to 17	$ 8404	$ 2300	$ 10704
18 to 23	$ 8380	$ 2300	$ 10680

Freight	Sale	Work	Total
#48	$ 2577	$ 1624	$ 4201
#49	$ 5178	$ 2300	$ 7478
#50	$ 11076	$ 3518	$ 14594
#99	$ 228	$ 462	$ 690

B. The Contractor further agrees that in the event that prior to July 1, 1969 the Engineer countermands the furnishing of the following Materials and the performance of the following Work, the Sale price and the Work price as set forth in the clause hereof entitled "General Agreements" shall be reduced by the following amounts:

a. Prices for deleting stops to shuttle elevators.

Sale	Work	Total	
(1) ~~-548~~	~~-449~~	~~-997~~	
$ (2) +150	$ -449	$ -299	per stop (first car)
(1) -471	-231	-702	
$ (2) +105	$ -231	$ -126	per stop (each additional car)

b. Prices for deleting an elevator opening.

Sale	Work	Total	
(1) -412	-420	-832	
$ (2) +125	$ -420	$ -295	per Opening (freight)
(1) -670	-586	-1256	@ front within rise
$ (2) +188	$ -586	$ -398	per Opening (first car-local)
(1) -450	-332	-782	within rise
$ (2) +117	$ -332	$ -215	per Opening (each additional car-local) within rise

(1) & (2) See page A-12 for explanation

5. AUTHORITY ACCESS TO RECORDS

The Authority shall have access during normal business hours to all records and documents of the Contractor relating to any amounts for which the Contractor has been compensated, or claims he should be compensated, by the Authority by payment determined on any basis other than by payment of a lump sum or unit price amount agreed upon in writing by the Contractor and the Authority. The Contractor shall obtain for the Authority similar access to similar records and documents of subcontractors. Such access shall be given or obtained both before and within a period of one year after Final Payment to the Contractor; provided, however, that if within the aforesaid one year period the Authority has notified the Contractor in writing of a pending claim by the Authority under or in connection with this Contract to which any of the aforesaid records and documents of the Contractor or of his subcontractors relate either directly or indirectly, then the period of such right of access shall be extended to the expiration of 6 years from the date of Final Payment with respect to the records and documents involved.

No provision in this Contract giving the Authority a right of access to records and documents is intended to impair or affect any right of access to records and documents which the Authority would have in the absence of such provision.

6. EXEMPTIONS FROM NEW YORK STATE AND NEW YORK CITY SALES TAXES: PURCHASE OF MATERIALS

Purchase by Contractor Directly

The purchase by the Contractor of the Materials sold hereunder will be a purchase for resale and therefore not subject to New York State or New York City sales or compensating use taxes, and the Sale of such Materials by the Contractor to the Authority, which is a governmental agency, will not be subject to such taxes.

Purchase Through Subcontractors

The purchase by subcontractors of Materials to be sold hereunder will also be a purchase for resale to the Contractor (either directly or through other subcontractors) and therefore not subject to New York State or New York City sales or compensating use taxes, provided that the subcontract agreements provide for the resale of such Materials separate and apart from the performance of the Work and that such subcontract agreements are in a form similar to this Contract with respect to the separation of the Sale of Materials from the performance of the Work.

Indemnity by Authority

In accordance with the above, the Contractor should not include an amount for such New York State and New York City taxes in the Sale Prices.

If (i) any claim is made against the Contractor by the State or City of New York for sales or compensating use taxes on the Sale of the aforementioned Materials or (ii) any claim is made against the Contractor by a materialman or a subcontractor on account of a claim against such materialman or subcontractor by the State or City of New York for sales or compensating use taxes on the Sale of the aforementioned Materials, then the Authority will reimburse the Contractor in an amount equal to the amount of such tax required to be paid in accordance with the requirements of law, provided that:

(a) (i) the applicable subcontract agreement in connection with this Contract provides for the resale of such Materials separate and apart from the performance of the Work, (ii) such subcontract agreement is in a form similar to this Contract with respect to the separation of the Sale of Materials from the performance of the Work, and (iii) such separation is actually followed in practice, including the separation of payments for Materials from the payments for the Work; and

(b) the Contractor, or the Contractor and any such subcontractor, as the case may be, have complied with such rules and regulations as may have been promulgated relating to the claiming of the exemption from such taxes and have filed all the forms and certificates required by the applicable laws, rules and regulations in connection therewith; and

(c) the Authority is afforded the opportunity, before any payment of tax is made, to contest said claim in the manner and to the extent that the Authority may choose and to settle or satisfy said claim, and such attorney as the Authority may designate is authorized to act for the purpose of contesting, settling and satisfying said claim; and

(d) the Contractor, or the Contractor and any such subcontractor, as the case may be, give immediate notice to the Authority of any such claim, cooperate with the Authority and its designated attorney in contesting said claim and furnish promptly to the Authority and said attorney all information and documents necessary or convenient for contesting said claim, said information and documents to be preserved for six years after date of Final Payment for the Sale or longer if such a claim is pending or threatened at the end of such six years.

If the Authority elects to contest any such claim, it will bear the expense of such contest.

The Authority will not reimburse the Contractor for New York State or New York City sales or compensating use taxes which may be required to be paid by him or by subcontractors in connection with the rental from others by the Contractor or subcontractors of construction equipment for use in the performance of the Contract. Accordingly, the Contractor agrees to pay such taxes and not include any amount for said taxes in his prices in this Contract.

CHAPTER II

ADJUSTMENTS AND PAYMENTS

7. REDUCTION OF PRICES.

If any Materials or Work required by the Contract Drawings and Specifications in their present form shall be countermanded or reduced, the Engineer shall have full authority on behalf of both parties to make such reduction in the Sale Price or Work Price as he may in his sole discretion deem equitable and reasonable, and in making such reduction, no allowance to the Contractor shall be made for anticipated profits.

The Director shall have the authority to agree in writing with the Contractor for reductions in the Sale Price or Work Price in lieu of those for which provision is heretofore made in this numbered clause.

In the case of deletion of the following Materials and Work, however, the reductions in the Sale and Work prices shall be as follows:

A. Deletion of the furnishing and installing of all ornamental Elevator Entrances for Concourse Level, 44th floor Skylobby and 78th floor Skylobby for Towers A & B.

	Sale	Work	Total
Tower A	$148,659	$45,225	$193,884
Tower B	$149,808	$47,629	$197,437

B. Deletion of the furnishing and installing laminated plastic, wood grain veneer panels in lieu of wood veneer panels in all local passenger cars.

	Sale
Tower A	$ 9,144
Tower B	$ 9,144
Below Grade	$ 762

C. Deletion of the furnishing and installing laminated plastic, wood grain, veneer panels in lieu of wood veneer panels in all shuttle and combination cars.

	Sale
Tower A	$ 4,715
Tower B	$ 4,715

* D. Deletion of the furnishing and installing of stainless steel facia on elevator hoistway entrances where elevators terminate at entrances where openings are 7' - 11" or 7' - 9-5/8".

	Sale
Tower A	$ 1,300
Tower B	$ 1,300

E. Deletion of the furnishing and installation of up to six (6) typical floor local passenger elevator hoistway entrances, each

(Opening Size - 4'-0" x 7'-6" H)

	Sale
Tower A	$ 530
Tower B	$ 530
Below Grade	$ 530

F. Deletion of furnishing and installation of up to six (6) typical floor freight elevator hoistway entrances, each

(Opening Size - 4'-5" W x 7'-6"H)

	Sale Center Opening Doors	Sale Dual Speed Doors
Tower A	$ 456	$ 470
Tower B	$ 456	$ 470

G. Deletion of the furnishing and installation of up to eleven (11) typical floor shuttle elevator hoistway entrances, each

(Opening Size - 5'-2" W x 7'-6" H)

	Sale Baked Enamel Finish	Sale Prime Finish
Tower A	$ 694	$ 669
Tower B	$ 694	$ 669

The Authority makes no representation that the reductions in Sale and Work will be limited to those items on which prices are quoted nor does it represent that the quantity of items reduced will not exceed the quantity upon which prices are quoted.

* See note on page A-24

8. COMPENSATION FOR EXTRAS

If Extra Materials be furnished or Extra Work be performed, the Contractor's compensation shall be increased by the following amounts, and such amounts only:

(a) In the case of Extra Materials procured or Extra Work performed by the Contractor himself, an amount equal to the actual net cost in money of such Extra Materials and of the labor required for such Extra Work, plus fifteen per cent (15%) of such net cost, plus such rental, for the number of hours during which equipment (other than small tools and exclusive of operator) is utilized for such Extra Work, as the Engineer deems reasonable.

(b) In the case of Extra Materials procured or Extra Work performed by a subcontractor, an amount equal to the actual net cost in money of such Extra Materials and of the labor required for such Extra Work, plus fifteen per cent (15%) of such net cost, plus such rental, for the number of hours during which equipment (other than small tools and exclusive of operator) is utilized for such Extra Work, as the Engineer deems reasonable, plus five per cent (5%) of the sum of the foregoing costs, percentage of cost, and rental.

As used in this clause (and in this clause only):

"Materials" means temporary and consumable Materials as well as permanent Materials; and "cost of Materials" means the price (including taxes actually paid by the Contractor as required by law upon the basis of such Materials) for which such Materials are sold for cash by the manufacturers or producers thereof, or by regular dealers therein, whether or not such Materials are purchased directly from the manufacturer, producer or dealer (or if the Contractor is the manufacturer or producer thereof, the reasonable cost to the Contractor of the manufacture and production), plus the reasonable cost of delivering such Materials to the construction site in the event that the price paid to the manufacturer, producer or dealer does not include delivery, and, in case of temporary Materials, less their salvage value, if any.

"Labor" means foremen, laborers, mechanics and other employees below the rank of superintendent directly employed at the construction site, whether employed by the Contractor or by the subcontractors, subject to the Engineer's authority to determine what employees of any category are "required for Extra Work" and as to the portion of their time allotted to Extra Work; and "cost of labor" means the proper proportion of wages actually paid to and received by such employees, plus a proper proportion of (a) vacation allowances and union dues and assessments which the employer actually pays pursuant to contractual obligation upon the basis of such wages, and (b) taxes actually paid by the employer pursuant to law upon the basis of such wages.

"Work day" in reference to an item of equipment means a day other than a Saturday, Sunday or legal holiday except that if the particular item of equipment is actually utilized at the construction site by the Contractor or subcontractors under this or any other Contract with the Authority on a Saturday, Sunday or legal holiday said day shall be deemed a work day.

The rental for equipment, whether owned by the Contractor or subcontractors or rented from others and notwithstanding the actual price of any rental or actual costs associated with such equipment, shall be computed by the Engineer on the basis of the following:

(1) (a) Hourly rental for those items of equipment listed in the "Green Book" (the publication of the Associated Equipment Distributors of 615 West 22nd Street, Oakbrook, Illinois 60523) shall be 80% of the applicable rates as listed in said book, reduced to an hourly basis (see formula below).

(b) Hourly rental for those items of equipment not listed in the "Green Book" shall be 100% of the applicable rates given in the "Blue Book" (published by Equipment Guide Book Co., 615 University Ave., Palo Alto, California 94301), reduced to an hourly basis (see formula below). The editions of these publications to be used shall be those in effect on the date of the opening of Proposals on this Contract. None of the provisions of the "Green Book" or the "Blue Book" shall be deemed referred to or included in this Contract excepting only the aforesaid rates. Accordingly, notwithstanding any provision to the contrary appearing in said publications, it is expressly agreed that the rental determined from the applicable rates in said publications in accordance with the provisions hereof covers items of cost and expense to the Contractor in connection with equipment of any type whatsoever, including gas, oil, maintenance, repairs, insurance, and, except in the case of equipment utilized just for Extras, transportation to and from the construction site.

(c) If no listing of rates for the item of equipment is made in either of the foregoing publications, the Engineer shall determine the reasonable rate of rental of the particular item of equipment by such other means as he finds appropriate.

(2) In instances where the rates appearing in the "Green Book" or the "Blue Book" are utilized, the Engineer shall determine the applicable rate and the hourly rental determined therefrom by applying the following criteria:

(a) Whether the rates to be applied from the foregoing publications shall be the daily, weekly, or monthly rates shall be determined by the number of consecutive work days in the period during which the particular equipment or a substitute item of equipment is continuously at the construction site for use by the Contractor or subcontractors under this or any other Contract with the Authority. Included within this period will be (1) workdays of idleness of the

equipment at the construction site whether such idleness results from acts or omissions of the Contractor, Authority or third persons, breakdowns in the equipment or any other cause, (ii) work days on which the equipment is removed from the construction site solely to enable the performance of repairs thereon, and (iii) work days intervening between the removal of equipment from the construction site for repairs and the delivery to the construction site of substitute equipment. The number of consecutive work days in the period for each rate shall be as indicated in the formula below:

Three work days or less - daily rate

More than three work days but no more than fifteen work days - weekly rate

More than fifteen work days - monthly rate

The pro rata portion which one hour bears to the applicable rate shall be determined in accordance with the following formula:

Hourly rate based on daily rental	1/8 (80% x daily rental from Green Book) or 1/8 (100% x daily rental from Blue Book)
Hourly rate based on weekly rental	1/40 (80% x weekly rental from Green Book) or 1/40 (100% x weekly rental from Blue Book)
Hourly rate based on monthly rental	1/176 (80% x monthly rental from Green Book) or 1/176 (100% x monthly rental from Blue Book)

(b) If the Engineer should determine that the nature or size of the equipment used by the Contractor in connection with Extras is larger or more elaborate, as the case may be, than the size or nature of the minimum equipment determined by the Engineer to be suitable for the Extras, the reasonable rental will not be based upon the equipment used by the Contractor but will be based on the smallest or least elaborate equipment determined by the Engineer to have been suitable for the performance of the Extras.

(3) In the case of equipment utilized only for Extras: (a) in addition to amounts determined as provided in subparagraphs (1) and (2) above, there will be included in the rental the reasonable cost of transporting such equipment to and from the construction site, and (b) notwithstanding the number of hours during which such equipment is utilized, the minimum rental therefor will be for a period of eight hours.

In computing the Contractor's compensation insofar as it is based upon Extra Materials and Extra Work, no consideration shall be given to any items of cost or expense not expressly set forth above, it being expressly agreed that the costs and percentage additions hereinbefore provided cover items of cost and expense to the Contractor of any type whatsoever, including administration, overhead, superintendence, taxes (other than those enumerated above), profit to the Contractor and small tools.

Whenever any Extra Materials are furnished (whether by the Contractor directly or through a subcontractor), the Contractor shall within one working day submit to the Engineer a memorandum showing the amount and character of Extra Materials furnished, from whom they were purchased, and within seven days thereafter the amount to be paid therefor.

Whenever any Extra Work is performed (whether by the Contractor directly or through a subcontractor), the Contractor shall, at the end of each day, submit to the Engineer (a) daily time slips showing the name and number of each workman employed on such Work, the number of hours which he is employed thereon, the character of his duties, and the wages to be paid to him, (b) a memorandum showing the rates and amounts of state and federal taxes based on such wages, and vacation allowances and union dues and assessments which the employer actually pays pursuant to contractual obligation upon the basis of such wages, and (c) a memorandum of the equipment used in the performance of such Work, together with the rental claimed therefor.

The memoranda and time slips required under the immediately preceding two paragraphs are for the purpose of enabling the Engineer to determine the amounts to be paid by the Authority under this clause; and accordingly, they shall constitute a condition precedent to such payment and the failure of the Contractor to furnish them with respect to any particular Materials or Work shall constitute a conclusive and binding determination on his part that such Materials or Work are not Extra Materials or Extra Work, and shall constitute a waiver by the Contractor of claims for payment for such Materials and Work.

The Director shall have authority to agree in writing with the Contractor on behalf of the Authority upon compensation for Extra Materials and Extra Work in lieu of the compensation for which provision is heretofore made in this clause. Such compensation shall be stated separately for the Extra Materials and for the Extra Work.

In the case of any order for any of the following Extra Materials and Extra Work, however, the Contractor shall, whenever the Director shall so direct, at his option, accept the following prices as full compensation therefor in lieu of all amounts set forth above.

A. Elevator Car Enclosures

1. Furnish one (1) shuttle elevator car enclosure — $ 7,355 Sale
   (Car Height - 9'-3"H)
   (Platform Size - 7'-3"W x 13'-3½"D)

2. Furnish one (1) local passenger elevator car enclosure — $ 4,000 Sale
   (Car Height - 8'-10"H)
   (Platform Size - 8'1½"W x 5'-7"D)

3. Furnish one (1) freight elevator car enclosure #48 — $ 5,013 Sale
   (Car Height - 9'-0"H)
   (Platform Size - 7'-3"W x 6' - 7"D)

4. Furnish one (1) freight elevator car enclosure #49 — $ 5,374 Sale
   (Car Height - 9'-0"H)
   (Platform Size - 7'11"W x 7'-0"D)

5. Furnish one (1) freight elevator car enclosure #50 — $ 5,796 Sale
   (Car Height - 9'-0"H)
   (Platform Size - 8'-0"W x 8' - 3"D)

6. Furnish one (1) passenger elevator car enclosure — $ 4,959 Sale
   (Car Height - 8'-6"H)
   (Platform Size - 5'-11"W x 8'-10½"D)

7. Furnish one (1) Below Grade passenger elevator car enclosure. — $ 4,089 Sale
   (Car Height - 8'-6"H)
   (Platform Size - 8'-0"W x 6'-0-3/4"D)

8. Furnish one (1) Below Grade passenger elevator car enclosure. J-1 or K-5 — $ 4,469 Sale
   (Car Height - 8'-6"H)
   (Platform Size - 9'-0"W x 7'-4"D)

9. Furnish one (1) Below Grade passenger elevator car enclosure. P-1 — $ 5,374 Sale
   (Car Height - 9'-0"H)
   (Platform Size - 8'-0"W x 10'-6"D)

10. Furnish one (1) Below Grade freight elevator car enclosure. K-1 — $ 5,417 Sale
    (Car Height - 8'-6"H)
    (Platform Size - 9'- "W x 7'-4½"D)

11. Furnish one (1) Below Grade freight elevator car enclosure. K-2 — $ 4,963 Sale
    (Car Height - 8'-6"H)
    (Platform Size - 8'-0"W x 6'-2"D)

12.	Furnish one (1) Below Grade freight elevator car enclosure. J-4 (Car Height - 8'-6"H) (Platform Size - 9'-0"W x 7'-4"D)	$5,847 Sale
13.	Furnish one (1) local passenger elevator car enclosure with wood panels faced with wood veneer on both sides in lieu of one side (reversible wall panels)	$4,341 Sale
14.	Furnish one (1) shuttle elevator car enclosure with wood panels faced with wood veneer on both sides in lieu of one side (reversible wall panels). Panel edging details shall be revised to suit.	$7,810 Sale
15.	Furnish one (1) freight elevator enclosure with fixed Tytron veneer frames in lieu of removable type.	Same as items $ 3,4,5,6 Sale
* 16.	Furnish and install twenty four (24) stainless steel facia panels on local passenger elevator car enclosures above the car doors to conceal door hardware at 7'-11' hoistway entrance openings.	$ 600 Sale
* 17.	Furnish and install (4) stainless steel facia panels on shuttle elevator car enclosure above car doors to conceal door hardware at 7'-9-5/8 hoistway entrance openings.	$ 100 Sale
18.	Furnish Brazilian Rosewood Veneer in lieu of Teak Veneer (yield factor of veneer to be estimated at 1/3 because of matching).	$22,226 Sale
19.	Furnish and install one (1) stainless steel (No. 7 Finish) integral certificate, car identity and car capacity frame for <u>each</u> elevator car enclosure in lieu of individual certificate, car identity and car capacity frames.	$ 75 ea. Sale

* <u>Note</u>: The requirement for extended cover plates as covered on page G-8, clause 146, paragraph A-1-b will result in an add to the elevator contract of $90.00 per entrance for additional interlock linkage. The additional linkage will not be required if item D. on page A-18 and items 16 and 17 on this page are accepted.

B. Elevator Hoistway Entrances

1. Furnish and install one (1) Concourse Level shuttle elevator hoistway entrance

   (Opening Size - 5'-2"W x 7'-6"H)

   $ 1,004 -Work
   $ 2,508 -Sale
   $ 3,512 -Total

2. Furnish and install one (1) Skylobby shuttle elevator hoistway entrance

   (Opening Size - 5'-2"W x 7'-6"H)

   $ 292 -Work
   $ 1,016 -Sale
   $ 1,308 -Total

3. Furnish and install one (1) Skylobby shuttle elevator hoistway entrance

   (Opening Size - 5'-2"W x 7'-9-5/8"H)

   $ 292 -Work
   $ 402 -Sale
   $ 694 -Total

	Baked Enamel	Prime Finish
4. Furnish and install up to eleven (11) typical floor shuttle elevator hoistway entrances (Opening Size - 5'-2"W x 7'-6"H)	$ 292	$ 292 /ea.-Work
	$ 402	$ 377 /ea.Sale
	$ 694	$ 669 /ea.-Total
	Baked Enamel	Prime Finish
5. Furnish and install more than eleven (11) typical floor shuttle elevator hoistway entrance (Opening Size - 5'-2"W x 7'-6"H)	$ 292	$ 292 /ea.-Work
	$ 402	$ 377 /ea.-Sale
	$ 694	$ 669 /ea.-Total

6. Furnish and install one (1) Concourse Level local passenger elevator hoistway entrance

   (Opening Size - 4'-0"W x 7'-6"H)

   $ 172 -Work
   $ 773 -Sale
   $ 945 -Total

7. Furnish and install one (1) Skylobby local passenger elevator hoistway entrance

   (Opening Size - 4'-0"W x 7'-11"H)

   $ 172 -Work
   $ 798 -Sale
   $ 970 -Total

8. Furnish and install up to six (6) typical floor local passenger elevator hoistway entrances

   (Opening Size - 4'-0" x 7'-6"H)

   $172 /ea.-Work
   $358 /ea.-Sale
   $530 /ea.-Total

9. Furnish and install more than six (6) floor local passenger elevator hoistway entrances

   (Opening Size - 4'-0"W x 7'-6"H)

   $172 /ea.-Work
   $358 /ea.-Sale
   $530 /ea.-Total

10. Furnish and install one (1) Concourse Level freight elevator hoistway entrance

    (Opening Size - 4'-6"W x 7'-6"H)

No.48	No.49	No.50
$176	$172	$172 -Work
$817	$285	$796 -Sale
$993	$457	$968 -Total

11. Furnish and install one (1) Skylobby freight elevator hoistway entrance

    (Opening Size - 4'-6"W x 7'-6"H)

No.49	No.50
$172	$172 -Work
$285	$796 -Sale
$457	$968 -Total

12. Furnish and install up to six (6) typical floor freight elevator hoistway entrances, prime finish

    (Opening Size - 4'-5"W x 7'-6"H)

Dual Speed	Center Opening
$176	$172 /ea.-Work
$295	$285 /ea.-Sale
$471	$457 /ea.-Total

13. Furnish and install more than six (6) typical floor freight elevator hoistway entrances

    (Opening Size -4'-6" x 7'-6"H)

Dual Speed	Center Opening
$176	$172 /ea.-Work
$295	$285 /ea.-Sale
$471	$457 /ea.-Total

14. Furnish and install one (1) Concourse Level Below Grade passenger elevator hoistway entrance

    (Opening Size - 4'-6"W x 7'-6"H)

    $172 -Work
    $796 -Sale
    $968 -Total

15. Furnish and install up to six (6) typical floor Below Grade passenger elevator hoistway entrances

(Opening Size - 4'-6"W x 7'-6"H)

$ 172 /ea.-Work
$ 255 /ea.-Sale
$ 427 /ea.-Total

16. Furnish and install more than six (6) typical floor Below Grade passenger elevator hoistway entrances

(Opening Size - 4'-6"W x 7'-6"H)

$ 172 /ea.-Work
$ 255 /ea.-Sale
$ 427 /ea.-Total

17. Furnish and install up to six (6) typical floor Below Grade passenger elevator hoistway entrances

(Opening Size - 4'-0"W x 7'-6"H)

$ 172 /ea.-Work
$ 255 /ea.-Sale
$ 427 /ea.-Total

18. Furnish and install one (1) Concourse Level Below Grade passenger elevator hoistway entrance

(Opening Size - 5'-0"W x 7'-6"H)

$ 176 /ea.-Work
$ 782 /ea.-Sale
$ 958 /ea.-Total

19. Furnish and install up to six (6) typical floor Below Grade passenger elevator hoistway entrances

(Opening Size - 5'-0"W x 7'-6"H)

$ 176 /ea.-Work
$ 295 /ea.-Sale
$ 471 /ea.-Total

20. Furnish and install six (6) stainless steel (No. 4 Finish) doors and frames for elevator hoistway entrances at a typical floor for local passenger elevators, each

$ 172 -Work
$ 680 -Sale
$ 852 -Total

21. Furnish and install six (6) baked enamel doors and frames for elevator hoistway entrances for local passenger elevators

$ 1,032 -Sale Work
$ 2,148 -Sale
$ 3,180 -Total

22. Furnish and install one (1) stainless steel (No. 4 Finish) door and frame for an elevator hoistway entrance at a typical floor for a shuttle elevator

$ 292 -Work

$ 922 -Sale

$ 1,214 -Total

23. Furnish and install six (6) Concourse Level stainless steel (No. 4 Finish) doors and frames for elevator hoistway entrances for local passenger elevators, each

$ 172 -Work

$ 680 -Sale

$ 852 -Total

The Authority makes no representation that additions in Sale and Work will be limited to those items on which prices are quoted nor does it represent that the quantity of items increased will not exceed the quantity upon which prices are quoted.

9. MONTHLY ADVANCES

On or about the first day of each month, the Engineer shall (upon receipt from the Contractor of such information as he may require) render the following three certificates to the Authority based upon the Engineer's estimates:

(a) Elevator Car Enclosures and Elevator Hoistway Entrances -

A certificate showing (i) the approximate amount of Materials (other than Extra Materials) delivered by the Contractor up to that time and a sum bearing the same proportion to the Sale Price as the Materials delivered (other than Extra Materials) bears to the total Materials required under this Contract (other than Extra Materials); (ii) the approximate amount of Extra Materials delivered by the Contractor up to that time and the approximate sum attributable to such Materials under the clause hereof entitled "Compensation for Extras".

(b) All Other Sale -

A certificate showing (i) the approximate amount of Materials (other than Extra Materials) ready for shipment or delivered by the Contractor up to that time and a sum bearing the same proportion to the Sale Price as the Materials ready for shipment or delivered (other than Extra Materials) bears to the total Materials required under this Contract (other than Extra Materials); (ii) the approximate amount of Extra Materials ready for shipment or delivered by the Contractor up to that time and the approximate sum attributable to such Materials under the clause hereof entitled "Compensation for Extras". Material will not be deemed "ready for shipment" until it has been inspected and approved by an Authority inspector, identified by stamping or stenciling as the property of the Authority and segregated from all other property of the Contractor and third persons.

(c) A certificate showing (i) the approximate amount of Work performed by the Contractor up to that time and a sum bearing the same proportion to the Work Price as the Work performed (other than Extra Work) bears to the total Work required under this Contract (other than Extra Work); (ii) the approximate amount of Extra Work performed by the Contractor up to that time and the approximate sum attributable to such Extra Work under the clause hereof entitled "Compensation for Extras", together with the sums applicable under the clause hereof entitled "Idle Salaried Men and Equipment".

As an aid to the Contractor and to facilitate his performance, the Authority shall, each month, within fifteen days after the receipt of such certificates, advance to the Contractor by separate checks the sums certified in each such certificate, minus, however, either (1) ten per cent of each sum certified pursuant to subparagraph (a)(i), subparagraph (b)(i), and subparagraph (c)(i) of this clause or (2) a total of five per cent of the sum of the Sale Price and the Work Price, whichever is less, and minus all prior advances and payments to the Contractor or for his account.

10. FINAL PAYMENTS

After the rendition of the Certificate of Completion of Sale or the Certificate of Completion of Work and upon receipt from the Contractor of such information as may be required, the Engineer shall certify in writing to the Authority and to the Contractor the total compensation earned by the Contractor in connection with the Sale or the Work, as the case may be.

If so required, the Contractor shall thereupon furnish to the Authority a detailed sworn statement of all claims, just and unjust, of subcontractors, materialmen and other third persons then outstanding and which he has reason to believe may thereafter be made on account of the Sale and Work.

Within thirty days after issuance of each such certificate of total compensation earned (or within thirty days after receipt of the documents provided for in the immediately preceding paragraph, if required), the Authority shall pay to the Contractor by check the amount stated in said certificate, less all other payments and advances whatsoever to or for the account of the Contractor. All prior estimates and payments shall be subject to correction in this payment, which is throughout this Contract called the Final Payment for the sale or for the Work, as the case may be.

The acceptance by the Contractor, or by anyone claiming by or through him, of a Final Payment shall be and shall operate as a release to the Authority of all claims and of all liability to the Contractor for all things done or furnished in connection with the Sale or Work, as the case may be, and for every act and neglect of the Authority and others relating to or arising out of such Sale or Work, including claims arising out of breach of contract and claims based on claims of third persons, excepting only his claims for reimbursement for certain sales taxes as hereinbefore provided. No payment, however, final or otherwise, shall operate to release the Contractor from any obligations in connection with this Contract.

The Contractor's agreement as provided in the immediately preceding paragraph above shall be deemed to be based upon the consideration forming part of this Contract as a whole and not to be gratuitous; but in any event even if deemed gratuitous and without consideration, such agreement as provided in the immediately preceding paragraph above shall nevertheless be effective. Such release shall include all claims, whether or not they have yet arisen or have yet been asserted and whether or not in litigation and even though still under consideration by the Authority or the Engineer. Such release shall be effective notwithstanding any purported reservation of right by the Contractor to preserve such claim. The acceptance of any check designated as "Final Payment for Sale" or "Final Payment for Work" or bearing any similar designation shall be conclusively presumed to demonstrate the intent of the Contractor that such payment was intended to be accepted as final, with the consequences provided in this clause, notwithstanding any purported reservation of rights.

The Contractor agrees that he shall not be entitled to, and hereby waives any right he might otherwise have to, and shall not seek any judgment whether under this Contract or otherwise for any such Final Payment or for an amount equivalent thereto or based thereon. or for any part thereof, if such judgment would have the effect of varying, setting aside, disregarding or making inapplicable the terms of this clause or have the effect in any way of entitling the Contractor to accept such Final Payment or an amount equivalent thereto or based thereon or any part thereof other than in the same fashion as a voluntary acceptance of a Final Payment subject to all the terms of this Contract including this clause, unless and until the Contractor should obtain a judgment on any claim arising out of or in connection with this Contract (including a claim based on breach of contract) for an amount not included in said Final Payment. In any case in which interest is allowable on the amount of the Final Payment, such interest shall be at the rate of 4% per annum for the period, if any, in which such interest is due.

11. WITHHOLDING OF PAYMENTS

If (1) the Contractor fails to perform any of his obligations under this Contract or any other agreement between the Authority and the Contractor (including his obligation to the Authority to pay any claim lawfully made against him by any materialman, subcontractor or workman or other third person which arises out of or in connection with the performance of this Contract or any other agreement with the Authority) or (2) any claim (just or unjust) which arises out of or in connection with this Contract or any other agreement between the Authority and the Contractor is made against the Authority or (3) any subcontractor under this Contract or any other agreement between the Authority and the Contractor fails to pay any claims lawfully made against him by any materialman, subcontractor, workman or other third person which arises out of or in connection with this Contract or any other agreement between the Authority and the Contractor or if in the opinion of the Director any of the aforesaid contingencies is likely to arise, then the Authority shall have the right, in its discretion, to withhold out of any payment (final or otherwise and even though such payment has already been certified as due) such sums as the Director may deem ample to protect it against delay or loss or to assure the payment of just claims of third persons, and to apply such sums in such manner as the Director may deem proper to secure such protection or satisfy such claims. All sums so applied shall be deducted from the Contractor's compensation. Omission by the Authority to withhold out of any payment, final or otherwise, a sum for any of the above contingencies, even though such contingency has occurred at the time of such payment, shall not be deemed to indicate that the Authority does not intend to exercise its right with respect to such contingency. Neither the above provisions for rights of the Authority to withhold and apply monies nor any exercise or attempted exercise of, or omission to exercise, such rights by the Authority shall create any obligation of any kind to such materialmen, subcontractors, workmen or other third persons.

Until actual payment to the Contractor, his right to any amount to be paid under this Contract (even though such amount has already been certified as due) shall be subordinate to the rights of the Authority under this clause.

If, however, the payment of any amount due the Contractor shall be improperly delayed by the fault of the Authority, the Authority shall pay the Contractor interest thereon at the rate of four per cent (4%) per annum for the period of delay, it being agreed that such interest shall be in lieu of and in liquidation of any damages to the Contractor because of such delay.

CHAPTER III

PROVISIONS RELATING TO TIME

12. TIMES FOR COMPLETION

The Contractor's obligations for the performance and completion of the Sale and Work within the times provided hereinafter and as set forth in the clause of the Specifications entitled "Construction Scheduling and Control - Critical Path Method" are of the essence of this Contract. The Contractor shall complete such performance (including Extra Materials and Extra Work) within the times hereinafter provided, subject, however, to the clause hereof entitled "Extensions of Time", and to the restraints noted on the Contractor's Critical Path Networks.

NOTE: A construction (temporary) elevator shall be completed within the number of calendar days indicated below, but exclusive of holidays that occur, from the date that the elevator shaft has been cleaned down by the General Contractor and the elevator returned by the General Contractor to the Contractor for completion. For the purpose of this clause the term "holidays" shall include only the following: New Years Day, Lincoln's Birthday, Washington's Birthday, Memorial Day, Fourth of July, Labor Day, Columbus Day, Election Day, Armistice Day, Thanksgiving Day and Christmas Day. However, it is agreed that in the event that the agreement between the Contractor and the Elevator Constructors' Union is changed in regard to the number of holidays the following schedule will be changed where applicable.

North Tower Building

Zone I - Local Elevators

Bank A

*24	91 Calendar Days
*25	91 Calendar Days
26	December 18, 1969
27	December 26, 1969
28	January 5, 1970
29	January 12, 1970

Bank B

30	February 11, 1970
31	February 19, 1970
32	February 27, 1970
33	March 6, 1970
*34	98 Calendar Days
*35	98 Calendar Days

Bank C

*36	105 Calendar Days
*37	105 Calendar Days
38	April 23, 1970
39	April 30, 1970
40	May 7, 1970
41	May 14, 1970

* Construction Elevator

Bank D

*42	112 Calendar Days	
*43	112 Calendar Days	
44	June 1, 1970	(Note I)
45	June 1, 1970	(Note I)
46	June 1, 1970	(Note I)
47	June 1, 1970	(Note I)

North Tower Building

Zone II - Local Elevators

Bank A

*51	91 Calendar Days
*52	91 Calendar Days
53	July 9, 1970
54	July 16, 1970
55	July 23, 1970
56	July 30, 1970

Bank B

57	August 18, 1970
58	August 25, 1970
59	September 1, 1970
60	September 1, 1970
*61	98 Calendar Days
*62	98 Calendar Days

Bank C

*63	105 Calendar Days
*64	105 Calendar Days
65	October 13, 1970
66	October 20, 1970
67	October 27, 1970
68	November 4, 1970

Bank D

*69	112 Calendar Days	
*70	112 Calendar Days	
71	December 1, 1970	(Note I)
72	December 1, 1970	(Note I)
73	December 1, 1970	(Note I)
74	December 1, 1970	(Note I)

* Construction Elevator

Note I - see page A-40

North Tower Building

Zone III - Local Elevators

Bank A

75	December 18, 1970	
*76	91 Calendar Days	
*77	91 Calendar Days	
78	December 28, 1970	
79	January 5, 1971	
80	January 12, 1971	

Bank B

81	January 28, 1971	
*82	98 Calendar Days	
*83	98 Calendar Days	
84	February 4, 1971	
85	February 11, 1971	
86	February 19, 1971	

Bank C

87	April 14, 1971	
*88	105 Calendar Days	
*89	105 Calendar Days	
90	April 21, 1971	
91	April 28, 1971	
92	May 5, 1971	

Bank D

**93	June 1, 1971	(Note I)
*94	112 Calendar Days	
*95	112 Calendar Days	
96	June 1, 1971	(Note I)
97	June 1, 1971	(Note I)
**98	June 1, 1971	(Note I)

* Construction Elevator

** Dependent on elevator machines being available from temporary elevatoring in Shaft #6 and Shaft #7 within Fifteen calendar days after top out of Structural Steel in Tower A.

Note I - see page A-40

North Tower Building

Zone II - Shuttle Elevators

* 1	182 Calendar Days	
* 2	182 Calendar Days	
3	September 1, 1970	(Note I)
4	December 1, 1970	(Note I)
* 5	203 Calendar Days	
* 6	301 Calendar Days	
* 7	301 Calendar Days	
8	September 1, 1970	(Note I)
9	September 1, 1970	(Note I)
10	September 1, 1970	(Note I)
11	September 1, 1970	(Note I)

Zone III - Shuttle Elevators

12	March 1, 1971	(Note I)
13	March 1, 1971	(Note I)
14	March 1, 1971	(Note I)
15	March 1, 1971	(Note I)
16	June 1, 1971	(Note I)
17	June 1, 1971	(Note I)
18	June 1, 1971	(Note I)
19	June 1, 1971	(Note I)
*20	224 Calendar Days	
*21	224 Calendar Days	
*22	224 Calendar Days	
23	June 1, 1971	(Note I)

Freight Elevators

***48	August 14, 1970
***49	March 3, 1971
*50	550 Calendar Days (including holidays)
99	November 27, 1970

* Construction Elevator (Concrete Hoist)

*** Date accepted as shown. However, the Contractor will install the subject elevator with optimum manpower at all times and should the car be completed prior to the specified date, the car will be turned over to the General Contractor for building purposes as approved by the Engineer.

Note I - see page A-40

South Tower Building

Zone I - Local Elevators

Bank A

*24	91 Calendar Days
*25	91 Calendar Days
26	July 30, 1970
27	August 6, 1970
28	August 13, 1970
29	August 20, 1970

Bank B

30	September 15, 1970
31	September 22, 1970
32	September 29, 1970
33	October 6, 1970
*34	98 Calendar Days
*35	98 Calendar Days

Bank C

*36	105 Calendar Days
*37	105 Calendar Days
38	November 23, 1970
39	December 1, 1970
40	December 8, 1970
41	December 15, 1970

Bank D

*42	112 Calendar Days	
*43	112 Calendar Days	
44	December 31, 1970	(Note I)
45	December 31, 1970	(Note I)
46	December 31, 1970	(Note I)
47	December 31, 1970	(Note I)

Zone II - Local Elevators

Bank A

*51	91 Calendar Days
*52	91 Calendar Days
53	February 16, 1971
54	February 24, 1971
55	March 3, 1971
56	March 10, 1971

* Construction Elevator

Note I - see page A-40

Bank B

57	April 1, 1971
58	April 8, 1971
59	April 15, 1971
60	April 15, 1971
*61	98 Calendar Days
*62	98 Calendal Days

Bank C

*63	105 Calendar Days
*64	105 Calendar Days
65	May 28, 1971
66	June 7, 1971
67	June 14, 1971
68	June 21, 1971

Bank D

*69	112 Calendar Days	
*70	112 Calendar Days	
71	July 13, 1971	(Note I)
72	July 13, 1971	(Note I)
73	July 13, 1971	(Note I)
74	July 13, 1971	(Note I)

Zone III - Local Elevators

Bank A

75	July 30, 1971
*76	91 Calendar Days
*77	91 Calendar Days
78	August 6, 1971
79	August 13, 1971
80	August 20, 1971

Bank B

81	September 10, 1971
*82	98 Calendar Days
*83	98 Calendar Days
84	September 17, 1971
85	September 24, 1971
86	October 1, 1971

* Construction Elevator

Note I - see page A-40

Bank C

87	November 19, 1971	
*88	105 Calendar Days	
*89	105 Calendar Days	
90	November 29, 1971	
91	December 6, 1971	
92	December 13, 1971	

Bank D

**93	January 10, 1972	(Note I)
*94	112 Calendar Days	
*95	112 Calendar Days	
96	January 10, 1972	(Note I)
97	January 10, 1972	(Note I)
**98	January 10, 1972	(Note I)

South Tower Building

Zone II - Shuttle Elevators

1	April 9, 1971	(Note I)
2	April 9, 1971	(Note I)
3	April 9, 1971	(Note I)
4	July 6, 1971	(Note I)
*5	203 Calendar Days	
*6	301 Calendar Days	
*7	301 Calendar Days	
8	April 9, 1971	(Note I)
9	April 9, 1971	(Note I)
*10	182 Calendar Days	
*11	182 Calendar Days	

Zone III - Shuttle Elevators

12	October 5, 1971	(Note I)
13	October 5, 1971	(Note I)
14	October 5, 1971	(Note I)
15	October 5, 1971	(Note I)
16	January 10, 1972	(Note I)
*17	245 Calendar Days	
*18	224 Calendar Days	
*19	224 Calendar Days	
20	January 10, 1972	(Note I)
21	January 10, 1972	(Note I)
22	January 10, 1972	(Note I)
23	January 10, 1972	(Note I)

* Construction Elevator

** Dependent on elevator machines being available from temporary elevatoring in Shaft #6 and Shaft #7 within Fifteen calendar days after top out of Structural Steel in Tower B.

Note I - see page A- 40

South Tower Building

Freight Elevators

***48	March 26, 1971
***49	October 8, 1971
*50	550 Calendar Days (including holidays)
99	July 8, 1971

Below Grade Elevators

J-1	May 7, 1969
J-2	May 7, 1969
J-3	May 7, 1969
K-3	December 2, 1969
K-4	December 2, 1969
K-5	December 2, 1969
P-1	December 2, 1969
J-4	August 29, 1969
K-1	August 29, 1969
K-2	December 2, 1969

Escalators

North Tower Building

A-1	April 1, 1970
A-2	April 1, 1970
A-3	July 1, 1970
A-4	July 1, 1970
A-5	July 1, 1970
A-6	July 1, 1970
A-7	January 4, 1971
A-8	January 4, 1971
A-9	January 4, 1971
A-10	January 4, 1971

South Tower Building

B-1	November 16, 1970
B-2	November 16, 1970
B-3	February 15, 1971
B-4	February 15, 1971
B-5	February 15, 1971
B-6	February 15, 1971
B-7	August 16, 1971
B-8	August 16, 1971
B-9	August 16, 1971
B-10	August 16, 1971

*** Date accepted as shown. However, the Contractor will install the subject elevator with optimum manpower at all times and should the car be completed prior to the specified date, the car will be turned over to the General Contractor for building purposes as approved by the Engineer.

Note I - see page A-40

Escalators - Below Grade

K-1	February 2, 1970
K-2	February 2, 1970
K-3	February 2, 1970
P-1	February 2, 1970
P-2	February 2, 1970
P-3	February 2, 1970
P-4	February 2, 1970
P-5	February 2, 1970
P-6	February 2, 1970
P-7	February 2, 1970
P-8	February 2, 1970
P-9	February 2, 1970
P-10	February 2, 1970
P-11	February 2, 1970
P-12	February 2, 1970
P-13	February 2, 1970
P-14	February 2, 1970
P-15	February 2, 1970
P-16	February 2, 1970
P-17	February 2, 1970
P-18	February 2, 1970
P-19	February 2, 1970
P-20	February 2, 1970
P-21	February 2, 1970
P-22	February 2, 1970
P-23	February 2, 1970
P-24	February 2, 1970
P-25	February 2, 1970
P-26	February 2, 1970
P-27	February 2, 1970

Note I

The completion dates established for these elevators are based upon occupancy dates provided by the Authority. If, for any reason, the occupancy dates cannot be met by the Authority, an extension in time corresponding to the delay shall be granted the Contractor.

NOTE: The definition of the word "occupancy" shall mean:

"The time the area is finished and ready for the first tenant to move his staff and property into the area served by a particular bank of elevators".

13. EXTENSIONS OF TIME.

The time above provided for completion of any part of the Sale or Work shall be extended (subject however to the provisions of this clause) only if in the opinion of the Engineer the Contractor is necessarily delayed in completing such part by such time solely and directly by a cause which meets all the following conditions:

1. Such cause is beyond the Contractor's control and arises without his fault
2. Such cause comes into existence after the Authority's acceptance of the Contractor's Proposal on this Contract and neither was nor could have been anticipated by investigation before such acceptance. It shall not be deemed that the Contractor could have anticipated strikes, lockouts, fire, explosion, theft, floods, riots, civil commotion, war, malicious mischief, acts of God, or acts of government not yet specifically proposed or taken.

Variations in temperature and precipitation shall be conclusively deemed to have been anticipated before such acceptance of this Contract except to the extent that the actual monthly average temperature varies from a temperature which is 10 per cent above or below the monthly normal temperature and except to the extent that the actual number of days of precipitation (of .10 inch or more) per month exceeds a number equal to two plus the normal number of days of precipitation per month.

In any case, the variations in temperature and precipitation described in the immediately preceding sentence will be cause for an extension of time only if occurring between the actual time of commencement of the Work at the construction site and the time for completion stipulated in the clause hereof entitled "Times for Completion" (or such time as extended as provided for herein). In the case of portions of months the number of days will be prorated by the Engineer. Temperature and precipitation shall be as recorded by the U.S. Weather Bureau in its publications, including that publication entitled "Local Climatological Data with Comparative Data" which is applicable to the area in which the Work is to be performed.

In any event, even though a cause of delay meets all the above conditions, any extension shall be granted only to the extent that (i) the performance of the Contract is actually and necessarily delayed and (ii) the effect of such cause cannot be anticipated and avoided or mitigated by the exercise of all reasonable precautions, efforts and measures (including planning, scheduling, and rescheduling), whether before or after the occurrence of the cause of delay, and no extension shall be granted for a cause of delay which would not have affected the performance of the Contract were it not for the fault of the Contractor or for other delay for which the Contractor is not entitled to an extension of time.

Any reference herein to the Contractor shall be deemed to include subcontractors and materialmen, whether or not in privity of contract with the Contractor, and employees and others performing any part of the Contract, and all the foregoing shall be considered as agents of the Contractor.

The period of any extension of time shall be that necessary to make up the time actually lost, subject to the provisions of this clause, and shall be only for the portion of the Contract actually delayed. The Engineer may defer all or part of his decision on an extension and any extension may be rescinded or shortened if it subsequently is found that the delays can be overcome or reduced by the exercise of reasonable precautions, efforts and measures.

As a condition precedent to an extension of time, the Contractor shall give written notice to the Engineer within 3 working days after the time when he knows or should know of any cause which might under any circumstances result in delay for which he claims or may claim an extension of time (including those causes which the Authority is responsible for or has knowledge of), specifically stating that an extension is or may be claimed, identifying such cause and describing, as fully as practicable at the time, the nature and expected duration of the delay and its effect on the various portions of the Contract. Since the possible necessity for an extension of time may materially alter the scheduling, plans and other actions of the Authority, and since, with sufficient opportunity, the Authority might if it so elects attempt to mitigate the effect of a delay for which an extension of time might be claimed, and since merely oral notice may cause disputes as to the existence or substance thereof, the giving of written notice as above required shall be of the essence of the Contract and the failure of the Contractor to give written notice as above required shall be a conclusive waiver of an extension of time.

It shall in all cases be presumed that no extension, or further extension, of time is due unless the Contractor shall affirmatively demonstrate to the satisfaction of the Engineer that it is. To this end the Contractor shall maintain adequate records supporting any claim for an extension of time, and in the absence of such records, the foregoing presumption shall be deemed conclusive.

14. IDLE SALARIED MEN AND EQUIPMENT.

If any salaried men or equipment of the Contractor or any subcontractor are necessarily kept continuously idle and wholly unoccupied at the construction site for a full day on each of five or more consecutive days on which they would be engaged in the performance of the Work but for causes due solely to acts or omissions of the Authority or the Engineer occurring after the opening of Proposals on this Contract, and if such idleness is not due to any cause within the control of the Contractor or of any of his subcontractors or materialmen or his or their employees, then the Authority shall pay to the Contractor and the Contractor shall accept (in addition to any sums otherwise payable under this Contract, and in full satisfaction of and in liquidation of all claims for damages because of such act or omission of the Authority or the Engineer) an amount equal to that which the employer actually pays such salaried employees during such full days of idleness, plus a proper proportion of vacation allowances and union dues and assessments actually paid by the employer pursuant to contractual obligations on the basis of such salaries, and a proper proportion of the taxes actually paid by the employer pursuant to law upon the basis of such salaries and plus such rental for such idle equipment as the Engineer deems reasonable.

The rental for idle equipment shall be computed by the Engineer in accordance with the provisions of the clause of the Form of Contract entitled "Compensation for Extras"; provided, however, that the five per cent (5%) of the rental to be paid in accordance with said clause in the case of equipment utilized by subcontractors shall not be payable in connection with such idle equipment; and provided further that the provisions of subparagraph (3) of said clause shall not be applicable to such idle equipment.

The Contractor shall give written notice to the Engineer before the end of the third of the above mentioned 5 or more consecutive days (whether or not the Authority is aware of the existence of any circumstances which might constitute a basis for payment under this clause), specifically stating that salaried men or equipment have been kept idle under

circumstances which might result in payment under this clause; and he shall furnish with such notice, for all the days that have occurred, and shall in addition furnish at the end of each additional day of the above mentioned 5 or more consecutive days, (a) a memorandum showing the name, payroll title, salary rate and employer of each of the salaried men claimed to have been kept idle at the construction site, and the rates and amounts and taxes based upon their salaries and the holiday and vacation allowances and union dues and assessments which the employer must actually pay pursuant to contractual obligations based on their salaries, and (b) a memorandum of the equipment claimed to be kept idle, together with the amount claimed as rental therefor. Said notice and memoranda are for the purpose of enabling the Engineer to verify the Contractor's claim at the time, and of enabling him to take such steps as may be necessary to remedy the conditions upon which the claim is based. The furnishing of such notice and memoranda shall be a condition precedent to payment under this clause, so that the day on which notice is given shall be counted as not later than the third of the above mentioned 5 or more consecutive days and no subsequent day shall be counted for which the above memoranda are not furnished at the end of such day.

15. DELAYS TO CONTRACTOR.

As between the Contractor and the Authority, the Contractor assumes the risk of all suspensions of or delays in performance of the Contract, regardless of the length thereof, arising from all causes whatsoever, whether or not relating to this Contract, including wrongful acts or omissions of the Authority or its contractors, except only to the extent, if any, that compensation or an extension of time may be due as expressly provided for elsewhere in this Contract for such suspension or delays, and, subject only to such exception, the Contractor shall bear the burden of all costs, expenses and liabilities which he may incur in connection with such suspensions or delays, and all such suspensions, delays, costs, expenses and liabilities of any nature whatsoever, whether or not provided for in this Contract, shall conclusively be deemed to have been within the contemplation of the parties.

Notwithstanding any provisions of this Contract, whether relating to time of performance or otherwise, the Authority makes no representation or guaranty as to when the construction site or any part thereof will be available for the performance of the Contract or as to whether conditions at the construction site will be such as to permit the Contract to be performed thereon without interruption or by any particular sequence or method or as to whether the performance of the Contract can be completed by the times required under this Contract or by any other time.

Wherever in connection with this Contract it is required, expressly or otherwise, that the Authority shall perform any act relating to the Contract, including making available or furnishing any real property, materials, or other things, no guaranty is made by the Authority as to the time of such performance and the delay of the Authority in fulfilling such requirement shall not result in liability of any kind on the part of the Authority except only to the extent, if any, that an extension of time or compensation may be due as expressly provided for, respectively in the clauses hereof entitled "Extensions of Time" and "Idle Salaried Men and Equipment".

16. CANCELLATION FOR DELAY

If the performance of the Contract or any portion of it shall in the opinion of the Director, be materially delayed, whether or not through the fault of the Contractor, by any cause which affects the Contractor's ability to perform the Contract without affecting to the same degree the Authority's own ability to perform it, either directly or through others, the Authority shall have the right at any time during the existence of such delay to cancel this Contract as to any portions not yet performed, without prejudice to the rights, liabilities and obligations of the parties under this Contract arising out of portions already performed, provided however, that such right of cancellation shall not exist if the delay be due to any wrongful act or omission of the Authority. In the event of such cancellation, no allowance shall be made for anticipated profits.

17. ESCALATION DUE TO CERTAIN CAUSES

1. If the Authority or its contractors (other than the Contractor under this Contract) are the sole and direct cause of a delay in either the commencement of installation or the completion of installation of any elevator or escalator until more than one year after the scheduled date for such co commencement or completion, then in addition to amounts provided for elseware in the Contract, the Authority shall reimburse the Contractor for the following amounts, to the extent that such amounts are not included in other amounts paid or due to the Contractor:

(a) its actual net increase in costs for the Sale and the Work for such elevator or escalator occurring after the end of such one year;

(b) a percentage of the original profit for such elevator or escalator equal to the per cent which such actual net increase in cost represents of the original cost for such elevator or escalator.

2. If the commencement of installation or the completion of installation of any elevator or escalator is delayed until more than one year after the scheduled date for such commencement or completion solely and directly by a cause for which the Contractor would be entitled to an extension of time under the clause hereof entitled "Extensions of Time" but other than a cause provided for in paragraph (1) above and other than a cause within the risk of the Contractor, as defined below, then, in addition to amounts provided for elsewhere in the Contract the Authority shall reimburse the Contractor for the following amounts to the extent that such amounts are not included in other amounts paid or due to the Contractor: (a) an amount as provided in subparagraph (a) of paragraph (1) above; (b) if such commencement or completion is delayed as described in this paragraph (2) more than four years after the scheduled date for such commencement or completion, then the Authority shall also pay to the Contractor a percentage of the original profit for such elevator or escalator equal to the per cent which the actual net increase in cost incurred after such four years represents of the original cost for such elevator or escalator.

3. As to amounts provided for under paragraphs (1) and (2) above, 90 per cent thereof shall be paid monthly following billing from the Contractor showing that such costs have been incurred and the remainder, as well as other amounts previously retained on completed elevators and escalators, shall be paid as part of the final payment or within 60 days after the expiration of two years of delays as defined in said paragraphs (1) and (2), whichever is earlier.

4. In the event of payments becoming due under either paragraph (1) or (2) above, the Authority shall also pay to the Contractor a further advance for such elevator or escalator consisting of costs as defined below that have been incurre by the Contractor to date to the extent not included in prior advances. Within 60 days after the expiration of two years of

delays as defined in said paragraphs (1) and (2) above, the Authority shall pay a still further advance for said elevator or escalator consisting of that portion of the original profit for such elevator or escalator which is properly allocable to such costs, to the extent not included in prior advances.

5. (a) As used in this clause "original profit" means the amount included as profit in the estimates used by the Contractor for this Contract as of September 1966 and "original cost" means cost of the type defined below included by the Contractor in such estimates.

(b) For the purpose of this clause and this clause only, causes within the risk of the Contractor shall mean all circumstances involved in the Contractor's procurement or use of labor, materials, equipment, plant and other facilities either itself or through others, whether or not such circumstances are within the Contractor's control, whether or not they would be cause for an extension of time under the clause hereof entitled "Extensions of Time" and whether or not the Contractor is at fault.

(c) The increases in cost referred to in this clause mean only those which would not have been incurred by the Contractor but for the delays described in this clause after the applicable one year or four year period as the case may be and which are and continue to be due soley and directly to such delays.

(d) The periods of delays referred to in this clause shall mean those periods due soley and directly to the causes of delays described in this clause after deducting from the total delays in commencement or completion of installation those periods of delays due to all causes other than in paragraphs (1) or (2).

(e) The scheduled date for commencement or completion referred to above means the date set forth in the schedule of commencement dates appearing below, in the case of commencement, or set forth in the clause hereof entitled "Times for Completion", in the case of completion.

(f) In computing the period of delays referred to in this clause, such delays shall be taken into account only to the extent that, in addition to meeting the conditions of this clause, they are delays for which the Contractor would be entitled to an extension of time under the clause hereof entitled "Extensions of Time".

6. "Net increase in Cost" for the purpose of this clause shall be computed as follows:

(a) The increase in cost shall be the difference between the costs in effect at the end of the one year of the above defined delays and the costs actually incurred thereafter.

(b) Costs of manufacture shall consist of the price for purchase of materials, cost for direct labor, and standard plant overhead.

(c) Standard plant overhead shall not include any plant overhead for periods not devoted to performance of the Sale under this Contract.

(d) Cost of field labor shall consist of the cost of labor as the terms "labor" and "cost of labor" are defined in the clause hereof entitled "Compensation for Extras".

(e) Costs shall include, among others, administrative, regional and engineering costs.

7. The rights of the Contractor under this clause are subject to performance by the Contractor of all the following obligations, each of which shall be a condition precedent to the existence of such rights:

A. The Contractor shall give written notice to the Director as soon as practicable after he knows or should know of the occurrence of any act, omission or other circumstance which might under any conditions result in a claim for compensation under this clause (including circumstances which the Authority is responsible for or has knowledge of) specifically stating that compensation is or may be claimed, identifying such circumstances and describing as fully as practicable at the time the nature and expected duration of the delay to be expected from such cause and its effect on the various portions of the Contract. Such notice shall be given periodically as circumstances occur or further develop so as to keep the Director fully informed of all developments and so as to enable him to take such action as he may deem appropriate to mitigate or avoid the effects of any delay.

B. The Contractor shall comply with any orders of the Director to reschedule performance of any part of the Sale or Work in order to mitigate or avoid the effects of any delays and shall furnish to the Director, whether or not specifically requested, in sufficient time to permit the Director to order such rescheduling, full information on how any rescheduling could accomplish such mitigation or avoidance and on what costs and other results such rescheduling might give rise to; provided, however, that the actual net increases in cost to the Contractor, as defined in this clause resulting solely and directly from such rescheduling shall be paid by the Authority to the Contractor.

C. The Contractor shall give to the performance of this Contract at least the priority accorded to the most favored of any other jobs being performed by the Contractor.

D. The Contractor shall assign to the Authority, for the sole use and benefit of the Authority, all rights which the Contractor may have to recovery from others of any damages or loss on account of any of the aforementioned delays, such assignment to permit the Authority to pursue such rights in the name of the Contractor or in the name of the Authority, as the Authority may elect, and the Contractor shall cooperate fully with the Authority in any negotiations or proceedings conducted by the Authority in connection with such rights.

8. The Contractor has included in his Sale and Work prices under this Contract a contingency in the amount of $3,300,000 as contained in the Contractor's proposal of September, 1966 for escalation of costs for factory labor, material and field labor. In the event of any U.S. Government price or wage freeze or rollback whereby any of the anticipated increases in costs which were included by the Contractor in estimating escalation are not required to be expended, then such increases in costs not required to be expended shall be deducted from the Sale and Work prices under this Contract, but in no event shall said deduction exceed $3,300,000. Whether or not said amount of $3,300,000 is sufficient to cover increases which may occur in any types of costs estimated by the Contractor or omitted in his estimates, there shall be no increase in the Contractor's compensation on account of increases in costs except only as may be specifically provided for above in this clause or elsewhere in this Contract.

Tower "A" Elev. No.	Start Installation Date
1 to 50 inclusive	10/4/68 *
51 to 74 inclusive	8/11/69 *
75 to 98 inclusive	1/26/70 *
99	6/29/70 *
Below Grade Elevs.	
J-1	12/5/68
J-2	12/5/68
J-3	12/5/68
J-4	3/28/69
K-1	3/28/69
K-2	6/27/69
K-3	6/27/69
K-4	6/27/69
K-5	6/27/69
P-1	6/27/69
Below Grade Escs.	
P-1	6/15/69
P-2	6/15/69
P-3	6/15/69
P-4	6/15/69
P-5	6/15/69
P-6	6/15/69
P-7	6/15/69
P-8	6/15/69
P-9	6/15/69
P-10	6/15/69

Elev. No.	Start Installation Date
Below Grade Escs. (contd.)	
P-11	7/15/69
P-12	7/15/69
P-13	7/15/69
P-14	7/15/69
P-15	7/15/69
P-16	7/15/69
P-17	7/15/69
P-18	7/15/69
P-19	6/1/69
P-20	6/1/69
P-21	6/1/69
P-22	6/1/69
P-23	6/1/69
P-24	6/1/69
P-25	6/1/69
P-26	6/1/69
P-27	6/1/69
K-1	6/15/69
K-2	6/15/69
K-3	6/15/69
Tower Escs.	
A-1	12/15/68
A-2	12/15/68
A-3	8/28/69
A-4	8/28/69
A-5	9/2/69
A-6	9/2/69
A-7	2/6/70
A-8	2/6/70
A-9	2/11/70
A-10	2/11/70
B-1	8/13/69
B-2	8/13/69
B-3	4/6/70
B-4	4/6/70
B-5	4/13/70
B-6	4/13/70
B-7	9/18/70
B-8	9/18/70
B-9	9/23/70
B-10	9/23/70

* The dates for Tower "B" shall be 225 days later than those shown for Tower "A".

CHAPTER IV

CONDUCT OF CONTRACT

18. AUTHORITY OF DIRECTOR

Inasmuch as the public interest requires that the project to which this Contract relates shall be performed in the manner which the Authority, acting through the Director deems best, the Director shall have absolute authority to determine what is or is not necessary or proper for or incidental to the portion thereof specified in the clause hereof entitled "General Agreements" and the Contract Drawings and Specifications shall be deemed merely his present determination on this point. In the exercise of this authority, he shall have power to alter the Contract Drawings and Specifications; to require the furnishing of Materials and the performance of Work not required by them in their present form, even though of a totally different character from that now required; and to vary, increase and diminish the character, quantity and quality of, or to countermand any Materials or Work now or hereafter required. Such variation, increase, diminution or countermanding need not be based on necessity but may be based on convenience.

If at any time it shall be, from the viewpoint of the Authority, impracticable or undesirable in the judgment of the Director to proceed with or continue the performance of the Contract or any part thereof, whether or not for reasons beyond the control of the Authority, he shall have authority to suspend performance of any part or all of the Contract until such time as he may deem it practicable or desirable to proceed. Moreover, if at any time it shall be, from the viewpoint of the Authority, impracticable or undesirable in the judgment of the Director to proceed with or continue the performance of the Contract or any part thereof for reasons beyond the control of the Authority, he shall have authority to cancel this Contract as to any or all portions not yet performed and as to any Materials not yet installed even though delivered. Such cancellation shall be without prejudice to the rights and obligations of the parties arising out of portions already performed, but no allowance shall be made for anticipated profits.

19. AUTHORITY AND DUTIES OF ENGINEER

To resolve all disputes and to prevent litigation the parties to this Contract authorize the Engineer, acting personally, to decide all questions of any nature whatsoever arising out of, under, or in connection with, or in any way related to or on account of, this Contract (including claims in the nature of breach of contract or fraud or misrepresentation before or subsequent to acceptance of the Contractor's Proposal and claims of a type which are barred by the provisions of this Contract) and his decision shall be conclusive, final and binding on the parties. His decision may be based on such assistance as he may find desirable, including advice of engineering specialists. The effect of his decision shall not be impaired or waived by any negotiations or settlement offers in connection with the question decided, whether or not he participated therein himself, or by any prior decision of others, which prior decisions shall be deemed subject to review, or by any termination or cancellation of this Contract.

All such questions shall be submitted in writing by the Contractor to the Engineer, acting personally, for his decision, together with all evidence and other pertinent information in regard to such questions, in order that a fair and impartial decision may be made. In any action against the Authority relating to any such question the Contractor must allege in his complaint and prove such submission, which shall be a condition precedent to any such action. No evidence or information shall be introduced or relied upon in such an action that has not been so presented to the Engineer personally. Neither the requirements of this paragraph nor the time necessary for compliance therewith, however, shall affect the time when the Contractor's cause of action shall be deemed to have accrued for purposes of any statute controlling actions against the Authority, and the time of such accrual shall be determined without reference to this paragraph.

In the performance of the Contract, the Contractor shall conform to all orders, directions and requirements of the Engineer and shall perform the Contract to the satisfaction of the Engineer at such times and places, by such methods and in such manner and sequence as he may require, and the Contract shall at all stages be subject to his inspection. The Engineer shall determine the amount, quality, acceptability and fitness of all parts of the Materials and Work and shall interpret the Contract Drawings, Specifications and any orders for Extra Materials and Extra Work. The Contractor shall employ no equipment, materials, methods or men to which the Engineer objects, and shall remove no materials, equipment or other facilities from the construction site without permission. Upon request, the Engineer shall confirm in writing any oral order, direction, requirements or determination.

The enumeration herein or in the Specifications of particular instances in which the opinion, judgment, discretion or determination of the Engineer shall control or in which the Contract shall be performed to his satisfaction or subject to his inspection, shall not imply that only the matters of a nature similar to those enumerated shall be so governed and performed, but without exception the entire Contract shall be so governed and so performed.

20. NOTICE REQUIREMENTS.

No claim against the Authority shall be made or asserted in any action or proceeding at law or in equity, and the Contractor shall not be entitled to allowance of such claim, unless the Contractor shall have complied with all requirements relating to the giving of written notice and of information with respect to such claim as provided in this clause. The failure of the Contractor to give such written notice and information as to any claim shall be conclusively deemed to be a waiver by the Contractor of such claim, such written notice and information being conditions precedent to such claim. As used herein "claim" shall include any claim arising out of, under, or in connection with, or in any way related to or on account of, this Contract (including claims in the nature of breach of contract or fraud or misrepresentation before or subsequent to acceptance of the Contractor's Proposal and claims of a type which are barred by the provisions of this Contract) for damages, payment or compensation of any nature or for extension of any time for performance of any part of this Contract.

The requirements as to the giving of written notice and information with respect to claims shall be as follows:

1. In the case of any claims for extras, extensions of time for completion, idle salaried men and equipment, or any other matter for which requirements are set forth elsewhere in this Contract as to notice and information, such requirements shall apply.

2. In the case of all other types of claim, notice shall have been given to the Engineer, personally, as soon as practicable, and in any case, within 48 hours, after occurrence of the act, omission, or other circumstances upon which the claim is or will be based, stating as fully as practicable at the time all information relating thereto. Such information shall be supplemented with any further information as soon as practicable after it becomes or should become known to the Contractor, including daily records showing all costs which the Contractor may be incurring or all other circumstances which will affect any claim to be made, which records shall be submitted to the Engineer, personally.

The above requirements for notices andinformation are for the purpose of enabling the Authority to avoid waste of public funds by affording it promptly the opportunity to cancel or revise any order, change its plans, mitigate or remedy the effects of circumstances giving rise to a claim or take such other action as may seem desirable and to verify any claimed expense or circumstances as they occur, and the requirements herein for such notice and information are essential to this Contract and are in addition to any notice required by statute with respect to suits against the Authority.

The above referred to notices and information are required whether or not the Authority is aware of the existence of any circumstances which might constitute a basis for a claim and whether or not the Authority has indicated it will consider a claim.

No act, omission or statement of any kind shall be regarded as a waiver of any of the provisions of this clause or may be relied upon as such waiver except only either a written statement signed by the Executive Director or Deputy Executive Director of the Authority or a resolution of the Commissioners of the Authority expressly stating that a waiver is intended as to any particular provision of this clause, and more particularly no discussions, negotiations, consideration, correspondence, or requests for information with respect to a claim by any Commissioner, officer, employee, agent, consultant or contractor of the Authority shall be construed as a waiver of any provision of this clause or as authority or apparent authority to effect such a waiver.

Since merely oral notice or information may cause disputes as to the existence or substance thereof, and since notice, even if written, to other than the Authority representative above designated to receive it may not be sufficient to come to the attention of the representative of the Authority with the knowledge and responsibility of dealing with the situation, only notice and information complying with the express provisions of this clause shall be deemed to fulfill the Contractor's obligation under this Contract.

21. MINIMUM WAGES

The Contractor shall pay (and shall cause all subcontractors to pay) to his or their workmen, laborers and mechanics (who are employed by him or them to work on an hourly or daily basis at any trade or occupation at or about the construction site) at least the prevailing rate of wage for others engaged in the same trade or occupation in the locality in which Work is being performed; and if any such workmen, laborers or mechanics are employed for more than eight hours in any calendar day, they shall be paid at an increased rate for overtime.

The provisions of this clause are inserted in this Contract for the benefit of such workmen, laborers and mechanics as well as for the benefit of the Authority; and if the Contractor of any subcontractor shall pay any such workman, laborer or mechanic less than the rates of wages above described, such workman, laborer or mechanic shall have a direct right of action against the Contractor or such subcontractor for the difference between the wages actually paid and those to which he is entitled under this clause. If such workman, laborer or mechanic is employed by any subcontractor whose subcontracts do not contain a provision substantially similar to the provisions of this clause (requiring the payment of at least the above minimum wages, and providing for a cause of action in the event of the subcontractor's failure to pay such wages), such workman, laborer and mechanic shall have a direct right of action against the Contractor. The Authority shall not be a necessary party to any action brought by any workman, laborer or mechanic to obtain a money judgment against the Contractor or any subcontractor pursuant to this clause.

Nothing herein contained shall be construed to prevent the Contractor or any subcontractor from paying higher rates of wages than the minimum rates hereinbefore prescribed; and nothing herein contained shall be construed to constitute a representation or guarantee that the Contractor or any subcontractor can obtain workmen, laborers and mechanics for the minimum rates of wages hereinbefore prescribed.

22. EQUAL EMPLOYMENT OPPORTUNITY.

During the performance of this Contract, the Contractor agrees as follows:

(a) The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color or national origin, and will take affirmative action to insure that they are afforded equal employment opportunities without discrimination because of race, creed, color or national origin. Such action shall be taken with reference, but not be limited, to: recruitment, employment, job assignment, promotion, upgrading, demotion, transfer, layoff or termination, rates of pay or other forms of compensation, and selection for training or retraining, including apprenticeship and on-the-job training.

(b) The Contractor shall send to each labor union or representative of workers with which he has or is bound by a collective bargaining or other agreement or understanding, a notice, to be provided by the State Commission for Human Rights, advising such labor union or representative of the Contractor's agreement under clauses (a) through (n) (hereinafter called "non-discrimination clauses"). If the Contractor was directed to do so by the Authority as part of the bid or negotiation of this Contract, the Contractor shall request such labor union or representative to furnish him with a written statement that such labor union or representative will not discriminate because of race, creed, color or national origin and that such labor union or representative either will affirmatively cooperate, within the limits of its legal and contractual authority, in the implementation of the policy and provisions of these non-discrimination clauses or that it consents and agrees that recruitment, employment, and the terms and conditions of employment under this Contract shall be in accordance with the purposes and provisions of these non-discrimination clauses. If such labor union or representative fails or refuses to comply with such a request that it furnish such a statement, the Contractor shall promptly notify the State Commission for Human Rights of such failure or refusal.

(c) The Contractor shall post and keep posted in conspicuous places, available to employees and applicants for employment, notices to be provided by the State Commission for Human Rights setting forth the substance of the provisions of clauses (a) and (b) and such provisions of the State's laws against discrimination as the State Commission for Human Rights shall determine.

(d) The Contractor shall state, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, that all qualified applicants will be afforded equal employment opportunities without discrimination because of race, creed, color or national origin.

(e) The Contractor shall comply with the provisions of Sections 291-299 of the Executive Law and the Civil Rights Law, shall furnish all information and reports deemed necessary by the State Commission for Human Rights under these non-discrimination clauses and such sections of the Executive Law, and shall permit access to his books, records and accounts by the State Commission for Human Rights, the Attorney General and the Industrial Commissioner for the purposes of investigation to ascertain compliance with these non-discrimination clauses and such sections of the Executive Law and Civil Rights Law.

(f) This Contract may be forthwith cancelled, terminated or suspended, in whole or in part, by the Authority upon the basis of a finding made by the State Commission for Human Rights that the Contractor has not complied with these non-discrimination clauses, and the Contractor may be declared ineligible for future contracts made by or on behalf of the State, the Authority or other public authority or agency of the State, until he has satisfied the State Commission for Human Rights that he has established and is carrying out a program in conformity with the provisions of these non-discrimination clauses. Such findings shall be made by the State Commission for Human Rights after conciliation efforts by the Commission have failed to achieve compliance with these non-discrimination clauses and after a verified complaint has been filed with the Commission, notice thereof has been given to the Contractor by the Commission and an opportunity has been afforded him to be heard publicly before three members of the Commission. Such sanctions may be imposed and remedies invoked independently of or in addition to sanctions and remedies otherwise provided by law

(g) The Contractor shall include the provisions of clauses (a) through (f) in every subcontract or purchase order in such a manner that such provisions will be binding upon each subcontractor or vendor as to operations to be performed within the State of New York. The Contractor shall take such action in enforcing such provisions of such subcontract or purchase order as the Authority may direct, including sanctions or remedies for non-compliance. If the Contractor becomes involved in or is threatened with litigation with a subcontractor or vendor as a result of such direction by the Authority, the Contractor shall promptly so notify the General Counsel of the Authority, requesting him to intervene and protect the interests of the Authority.

(h) The provisions of this clause which refer to the State Commission for Human Rights, the Attorney General and the Industrial Commissioner are inserted in this Contract for the benefit of such parties, as well as for the benefit of the Authority, and said Commission, Commissioner and the Attorney General shall have a direct right of action against the Contractor to effectuate the intent of this clause.

23. EXTRA ORDERS.

The Chief of the Planning & Construction Division, acting personally, may expressly agree in writing with the Contractor on the furnishing of Extra Materials and Extra Work for an agreed lump sum price or an estimated unit price compensation aggregating not more than $5,000 in connection with any one order. Except as specifically provided in the preceding sentence, no Extra Materials shall be furnished or Extra Work per formed except pursuant to written orders of the Director expressly and unmistakably indicating his

intention to treat the Materials or Work described therein as Extra; and, exclusive of Extra Materials or Extra Work expressly authorized by or pursuant to a resolution of the Commissioners of the Authority or its Committee on Construction, the Director shall have authority to order any item of Extra Materials or Extra Work, if the cost thereof to the Authority together with the cost of all other Extra Materials and Extra Work previously ordered and not expressly authorized as aforesaid will not be in the aggregate in excess of Five Hundred Thousand Dollars ($500,000.00).

In the absence of such an order signed by the Director or in the case of Extra Materials and Extra Work aggregating not more than $5,000 signed by the Chief of the Planning and Construction Division, acting personally, if the Engineer shall direct, order or require any Materials or Work, whether orally or in writing, which the Contractor deems to be Extra, the Contractor shall nevertheless comply therewith, but shall within one working day give written notice thereof to the Director and the Engineer, stating why he deems it to be Extra, and shall moreover furnish to the Engineer time slips and memoranda as required by the clause hereof entitled "Compensation for Extras". Said notice, time slips and memoranda are for the purpose of affording to the Director an opportunity to verify the Contractor's claim at the time and (if he desires so to do) to cancel promptly such order, direction or requirement of the Engineer, of affording to the Engineer an opportunity of keeping an accurate record of the materials, labor and other items involved, and generally of affording to the Authority an opportunity to take such action as it may deem desirable in light of the Contractor's claims. Accordingly, the failure of the Contractor to serve such notice or to furnish such time slips and memoranda shall be deemed to be a conclusive and binding determination on his part that the direction, order or requirement of the Engineer does not involve the furnishing or performance of Extra Materials or Extra Work, and shall be deemed to be a waiver by the Contractor of all claims for additional compensation or damages by reason thereof, such written notice, time slips and memoranda being a condition precedent to such claims.

The provisions of this Contract relating generally to the Sale and the Work shall apply without exception to any Extra Materials or Extra Work required, except to the extent that a written order in connection with any particular item of Extra Materials or Extra Work may expressly provide that any particular provisions of the Specifications or Contract Drawings do not apply.

24. TITLE TO MATERIALS.

All Materials to be sold hereunder shall be and become the property of the Authority upon delivery at the construction site or upon being especially adapted for the Sale, whichever may first occur, subject, however, to the Contractor's assumption of risk under the clause hereof entitled "Risks of Materials and Work Assumed by the Contractor."

The Contractor shall promptly furnish to the Authority such bills of sale and other instruments as may be required by it, properly executed,

acknowledged and delivered, assuring to it title to such Materials, free of encumbrances and shall mark or otherwise identify all such Materials as the property of the Authority.

25. ASSIGNMENTS AND SUBCONTRACTS

Any assignment or other transfer by the Contractor of this Contract or any part hereof or any monies due or to become due hereunder without the express consent in writing of the Authority shall be void and of no effect as to the Authority, provided, however, that the Contractor may subcontract portions of the Sale and Work to such persons as the Engineer may, from time to time, expressly approve in writing. All further subcontracting by any subcontractor shall also be subject to such approval of the Engineer. Approval of a subcontractor may be conditioned on (among other things) the furnishing, without expense to the Authority, of a surety bond guaranteeing payment by the subcontractor of claims of materialmen, subcontractors, workmen and other third persons arising out of the subcontractor's performance of any part of the Sale or Work.

No consent to any assignment or other transfer, and no approval of any subcontractor, shall under any circumstances operate to relieve the Contractor of any of his obligations; no subcontract, no approval of any subcontractor and no act or omission of the Authority or the Engineer shall create any rights in favor of such subcontractor and against the Authority; and as between the Authority and the Contractor, all assignees, subcontractors, and other transferees shall for all purposes be deemed to be agents of the Contractor. Moreover, all subcontracts and all approvals of subcontractors shall be and, regardless of their form, shall be deemed to be conditioned upon performance by the subcontractor in accordance with this Contract; and if any subcontractor shall fail to perform the Contract to the satisfaction of the Engineer, the Engineer shall have the absolute right to rescind his approval forthwith and to require the performance of the Contract by the Contractor personally or through other approved subcontractors.

26. CLAIMS OF THIRD PERSONS

The Contractor undertakes to pay all claims lawfully made against him by subcontractors, materialmen and workmen, and all claims lawfully made against him by other third persons arising out of or in connection with or because of the performance of this Contract and to cause all subcontractors to pay all such claims lawfully made against them.

27. CERTIFICATES OF PARTIAL COMPLETION (ESCALATORS)

If at any time prior to the rendition of the Certificate of Completion of Work, any portion of the permanent construction has been satisfactorily completed, and if in the judgment of the Engineer such portion of the permanent construction is not necessary for the operations of the Contractor but will be immediately useful to and is needed by the Authority for other purposes, the Engineer may render to the Authority and to the Contractor a certificate in

writing to that effect (herein called a Certificate of Partial Completion), and thereupon or at any time thereafter the Authority may take over and use the portion of the permanent construction described in such certificate and exclude the Contractor therefrom.

The rendition of the Certificate of Partial Completion shall not be construed to constitute an extension of the Contractor's time to complete the portion of the permanent construction to which it relates in the event that he has failed to complete the same in accordance with the terms of this Contract. Moreover, the acceptance of a Certificate of Partial Completion by the Authority shall not operate to release the Contractor from any obligations under or upon this Contract.

28. CERTIFICATES OF PARTIAL COMPLETION (ELEVATORS)

If at any time prior to the rendition of the Certificate of Acceptance a local elevator or individual shuttle, freight or below grade elevator of the permanent construction is useable, and if in the judgment of the Engineer such elevator is not necessary for the current operations of the Contractor but will be immediately useful to and is needed by the Authority for other purposes, the Engineer may render to the Authority and to the Contractor a certificate in writing to that effect (herein called a Certificate of Partial Completion), and thereupon or at any time thereafter the Authority may use such elevator described in such certificate and exclude the Contractor therefrom. The Contractor shall turn over such elevator to the Authority upon receipt by the Contractor from the Authority of a temporary acceptance in the following form:

TEMPORARY ACCEPTANCE

City New York, N.Y.

TO OTIS ELEVATOR COMPANY Date - - - - - - - - -

The Authority hereby acknowledges that the Contractor has today turned over to the Authority for its possession and use elevator(s) No. ----------which the Contractor is erecting in The World Trade Center.

The Authority agrees to operate these elevators at its own expense, to provide a competent operator in the car, to use Contractor's service to oil, grease, clean the equipment and furnish necessary supplies, upon the terms and conditions set forth in the separate Maintenance Contract between the Authority and the Contractor for the World Trade Center elevators, provided, however, that prior to completion of twenty elevators in Zone I. the following shall apply:

1. Standby service for maintenance will be provided during Contractor's normal working hours from Monday through Saturday, inclusive;
2. Callback service will be included at all other hours, Monday through Saturday, inclusive, at no additional cost provided elevator stoppages or malfunctions are the result of normal wear and tear or failure due to the Contractor.
3. On Sundays and all Contractor's regular holidays, the Authority will pay for callback service, which shall be computed as under the clause entitled "Compensation for Extras".

The Authority shall pay Contractor the amount of the full monthly maintenance price in the schedule "Monthly Maintenance Prices" in the separate Maintenance Contract between the Authority and the Contractor for the World Trade Center elevators. It is also further understood, if the Contractor is behind schedule, as shown by the Contractor's Critical Path Networks through his own fault, and it becomes necessary for the Authority to take over an elevator on temporary service, the Contractor will maintain the car at his expense.

The Contractor shall continue to provide such service until the revocation in writing of this temporary acceptance as hereinafter provided for and shall bill the Authority for its charges. The Authority understands their use of the elevators may impose an expense on Contractor for cleaning and reconditioning them on their return. For this expense, the Authority will pay Contractor an extra computed as under the clause entitled "Compensation for Extras".

This Temporary Acceptance shall not affect the terms of the Contract between the Authority and the Contractor and shall be subject to all the provisions thereof, and may be revoked by the Authority upon twenty-four hours notice in writing. The agreement between the Authority and the Contractor to furnish supplies or care of the elevators for a period of twelve months is not to commence until the signing of the final acceptance.

Note: Elevator cab (enclosure) and hoistway entrances have been thoroughly inspected and found satisfactory, subject to the terms of Contract WTC-320.00

Yours very truly,

THE PORT OF NEW YORK AUTHORITY

SALES NO._____ By_____

CONTRACT WITH_____

The rendition of the Certificate of Partial Completion shall not be construed to constitute an extension of the Contractor's time to complete the portion of the permanent construction to which it relates in the event that he has failed to complete the same in accordance with the terms of this Contract.

29. CERTIFICATE OF COMPLETION OF SALE

After the satisfactory delivery of all Materials whatsoever required to be sold and the making of such tests and inspections as may be necessary or desirable, the Engineer shall render to the Authority and to the Contractor a certificate in writing (herein called the Certificate of Completion of Sale) certifying that in his opinion all Materials under this Contract, including Extra Materials, have been delivered in accordance with the Contract Drawings and Specifications and the requirements of the Engineer, and certifying the date as of which such delivery was so completed.

The rendition of the Certificate of Completion of Sale shall not be construed to constitute an extension of the Contractor's time for performance in the event that he has failed to complete the Sale in accordance with the terms of this Contract. Moreover, the acceptance of the Certificate of Completion of Sale by the Authority shall not operate to release the Contractor from any obligations under or upon this Contract.

30. CERTIFICATE OF COMPLETION OF WORK.

After the satisfactory completion of all Work whatsoever required to be performed and the making of such tests and inspections as may be necessary or desirable, the Engineer shall render to the Authority and to the Contractor a certificate in writing (herein called the Certificate of Completion of Work) certifying that in his opinion all Work under this Contract, including Extra Work, has been completed in accordance with the Contract Drawings and Specifications and the requirements of the Engineer, and certifying the date as of which it was so completed.

The rendition of the Certificate of Completion of Work shall not be construed to constitute an extension of the Contractor's time for performance in the event that he has failed to complete the Work in accordance with the terms of this Contract. Moreover, the acceptance of the Certificate of Completion of Work by the Authority shall not operate to release the Contractor from any obligations under or upon this Contract.

31. CERTIFICATE OF ACCEPTANCE

Prior to issuance of the Certificate of Completion of Sale and the Certificate of Completion of Work, the Authority will be taking over various elevators or escalators in a completed condition. The Contractor shall turn over such elevators or escalators to the Authority upon receipt by the Contractor from the Authority of a Certificate of Acceptance in the following forms.

The rendition of the Certificates of Acceptance shall not be construed to constitute an extension of the Contractor's time for performance in the event that he has failed to complete the Sale and the Work in accordance with the terms of this Contract. Moreover, the rendering of the Certificates of Acceptance by the Authority shall not operate to release the Contractor from any obligations under or upon this Contract, subject to the provisions of the clause hereof entitled "Risks of Materials and Work Assumed by the Contractor".

ACCEPTANCE

New York, N.Y.
_____, 19__.

OTIS ELEVATOR COMPANY

Gentlemen:

We have examined the elevator plant identified below furnished by you under Contract WTC-320.00 in the World Trade Center (including elevator cab (enclosure) and hoistway entrances)* Such plant appears to be satisfactory and in accordance with your contract and we hereby accept it, subject to all the provisions of Contract WTC-320.00.

Yours truly,

Elevator No. _____ _____

By_____
Title

*Omit words in brackets where not applicable.

ACCEPTANCE

City.
Date

OTIS ELEVATOR COMPANY

Gentlemen:

We have examined the escalator plant identified below furnished by you under Contract WTC-320.00 in the World Trade Center. Such plant appears to be satisfactory and in accordance with your contract and we hereby accept it, subject to all the provisions of Contract WTC-320.00

Escalator No. ____ Yours truly,

_____

By_____
Title

CHAPTER V

WARRANTIES MADE AND LIABILITIES ASSUMED BY THE CONTRACTOR

32. CONTRACTOR'S WARRANTIES

The Contractor represents and warrants:

(a) That he is financially solvent, that he is experienced in and competent to perform the type of services contemplated by this Contract, that the facts stated or shown in any papers submitted or referred to in connection with his Proposal are true, and, if the Contractor be a corporation, that it is authorized to perform this Contract;

(b) That he is familiar with all general and special federal, state, municipal and local laws, ordinances and regulations, if any, which may in any way affect this Contract or its performance or those employed therein;

(c) That he has carefully examined and analyzed the Contract Drawings and the Specifications and inspected the construction site, that from his own investigations he has satisfied himself as to the nature of the Materials and Work needed for the performance of this Contract, the general and local conditions, and all other matters which in any way affect this Contract or its performance, and that the time available to him for such examination, analysis, inspection and investigations was adequate;

(d) That the Contract Drawings and Specifications are feasible of performance and that he can and will perform the Contract in strict accordance with the requirements thereof;

(e) That no Commissioner, officer, agent, employee, consultant or contractor of the Authority is personally interested directly or indirectly in this Contract or the compensation to be paid hereunder; and

(f) That, except only for those representations, statements or promises expressly contained in this Contract, no representation, statement, or promise, oral or in writing, of any kind whatsoever by the Authority, its Commissioners, officers, agent, employees, consultants or contractors has induced the Contractor to enter into this Contract or has been relied upon by the Contractor, including any with reference to: (1) general and special federal, state, municipal or local laws, ordinances or regulations which may in any way affect this Contract or its performance or those employed therein; (2) the requirements, meaning, correctness, suitability, or completeness of the Contract Drawings or the Specifications; (3) the nature, existence or location of materials, structures, obstructions, utilities or conditions, surface or subsurface, which may be encountered at the construction site; (4) the nature, quantity, quality or size of the Materials, Work, equipment, labor and other facilities needed for the performance of this Contract; (5) the general or local conditions which may in any way affect this Contract or its performance; or (6) any other matters, whether similar to or different from those referred to in (1) through (5) immediately above,

affecting or having any connection with this Contract, its negotiation, execution or performance or those employed therin or connected or concerned therewith.

Moreover, the Contractor accepts the conditions at the construction site as they may eventually be found to exist and warrants and represents that he can and will perform the Contract under such conditions and that all Materials and Work required because of any unforeseen conditions (physical or otherwise) shall be wholly at his own cost and expense, anything in this Contract to the contrary notwithstanding.

In any case, the Authority does not warrant or represent either by issuance of the Contract Drawings and Specifications or otherwise that the Contract may be performed by the times required or by any other times, and the Contractor shall make his own conclusions as to the time required for such performance.

The Contractor recognizes that in view of the magnitude and complexity of this Contract and the Sale and Work to be performed hereunder, negotiations, meetings, discussions, and communications between his representatives and those of the Authority were desirable to allow free and complete discussion of the Contract and the Sale and Work to be performed thereunder and that the disclaimers contained in this Contract as to representations, statements, or promises could not specifically identify every statement made in the course of such negotiations, meetings, discussions and communications which was not intended as a representation or promise or as a part of the Contract. The Contractor nevertheless affirms and agrees and represents and warrants that only the statements, representations and promises expressly contained in this Contract have been relied upon by him and have induced him to enter into this Contract.

The Contractor further represents and warrants that he was given ample opportunity and time, and by means of this paragraph was requested by the Authority, to review thoroughly all documents forming this Contract prior to execution of this Contract in order that he might request inclusion in this Contract of any statement, representation, promise or provision which he desired or on which he wished to place reliance; that he did so review said documents; that either every such statement, representation, promise or provision has been included in this Contract or else, if omitted, that he expressly relinquishes the benefit of any such omitted statement, representation, promise or provision and is willing to perform this Contract without claiming reliance thereon or making any other claim on account of such omission.

The Contractor further recognizes that the provisions of this clause (though not only such provisions) are essential to the Authority's consent to enter into this Contract and that without such provisions, the Authority would not have entered into this Contract.

33. RIGHTS OF THE CITY OF NEW YORK

The Contractor assumes the following distinct and several risks whether they arise from acts or omissions (whether negligent or not) of the Contractor, of the Authority, of The City of New York or of other third persons, or from any other cause, and whether such risks are within or beyond the control of the Contractor, excepting only risks which arise solely from affirmative acts done by the Authority or the City of New York subsequent to the execution of this Contract with actual and wilful intent to cause the loss, damage and injuries described below:

(a) The risk of loss or damage to surface and subsurface utilities, structures and other installations and other property (whether similar to or different from such utilities, structures and other installations) of The City of New York arising out of or in connection with the performance of the Contract or out of or in connection with the Contractor's operations to the extent that such performance or operations are at or in the vicinity of the construction site.

(b) The risk of claims, just or unjust, by third persons against The City of New York on account of injuries (including wrongful death), loss or damage of any kind whatsoever arising or alleged to arise out of or in connection with the performance of the Contract or out of or in connection with the Contractor's operations to the extent that such performance or operations are at or in the vicinity of the construction site.

The loss, damage, and claims described in subparagraphs (a) and (b) above include those sustained or made at any time, both before and after the rendition of the Certificate of Completion of Sale or the Certificate of Completion of Work. The Contractor shall indemnify The City of New York against all loss, damage, and claims described in subparagraphs (a) and (b) above and for all expense incurred by The City of New York in the defense, settlement or satisfaction of such claims, including expenses of attorneys. If so directed by The City of New York, the Contractor shall, at his own expense, defend against such claims.

Neither the issuance of a Certificate of Completion nor the making of Final Payment shall release the Contractor from his obligations under this clause. The enumeration elsewhere in this Contract of particular risks assumed by the Contractor or of particular claims for which he is responsible shall not be deemed to limit the effect of the provisions of this clause or to imply that he assumes or is responsible for only risks or claims of the type enumerated; and neither the enumeration in this clause nor the enumeration elsewhere in this Contract of particular risks assumed by the Contractor or of particular claims for which he is responsible shall be deemed to limit the risks which the Contractor would assume or the claims for which he would be responsible in the absence of such enumerations.

The City of New York shall have a direct right of action against the Contractor to enforce the foregoing indemnities.

The obligations of the Contractor under this clause are within the coverage of the liability insurance policy procured by the Authority referred to elsewhere in this Contract, subject to the limits of said policy and to all the terms of said policy.

34. NO THIRD PARTY RIGHTS

Nothing contained in this Contract is intended for the benefit of third persons, except to the extent that the Contract specifically provides otherwise by use of the words "benefit" or "direct right of action".

35. WAIVER OF ADMIRALTY RIGHTS

The Contractor hereby waives any rights to limitation or apportionment of damages under the law of admiralty or to limitation of liability under 33 U.S.C.A. Chapter 9 (Protection of Navigable Waters and of Harbor and River Improvements), 46 U.S.C.A. Chapter 8 (Limitations of Vessel Owner's Liability), and any other similar statutes, in connection with damage which may occur to property of the Authority, or of The City of New York arising out of or in connection with performance of the Contract whether the right to recover for such damage arises under this Contract or otherwise. Such waiver shall be for the benefit of The City of New York as well as for the benefit of the Authority.

36. RISKS OF MATERIALS AND WORK ASSUMED BY THE CONTRACTOR

The Contractor assumes the risk of loss or damage to the Materials sold hereunder occurring prior to their incorporation in the permanent construction even though a Certificate of Completion of Sale has been issued and to the permanent construction occurring prior to the rendition of the Certificate of Completion of Work (other than loss or damage to the portions of the permanent construction with respect to which Certificates of Partial Completion have been issued) whether such risk arises from acts or omissions (whether negligent or not) of the Contractor, of the Authority or of third persons, or from any other cause, and whether such risk is within or beyond the control of the Contractor, excepting only a risk which arises solely from affirmative acts done by the Authority subsequent to the opening of Proposals on this Contract with actual and wilful intent to cause such loss or damage. The Contractor shall forthwith repair, replace and make good any such loss or damage to the Materials and permanent construction without cost to the Authority.

37. WAIVER BY CONTRACTOR, SUBCONTRACTORS AND OWNERS OF EQUIPMENT

As between the Authority and the Contractor, the Contractor assumes the risk of loss or damage to his property occurring at any time prior to completion of removal of such property from the construction site or Authority premises or the vicinity thereof and the Contractor waives any rights he may have against the Authority for such loss or damage, said assumption of risk and waiver to be effective notwithstanding any negligence of the Authority, its Commissioners, officers, agents, employees, consultants or contractors. In addition, as a condition precedent to approval by the Authority of any subcontractor and before any subcontractor is permitted to bring equipment or other property to the construction site or Authority premises or the vicinity thereof, the Contractor shall procure an agreement by such subcontractor, for the benefit of the Authority, to the effect that the subcontractor assumes the risk of loss or damage to his property occurring at any time prior to completion or removal of such property from the construction site or Authority premises or the vicinity thereof and that he waives any rights he might have against the Authority for such loss or damage, said assumption of risk and waiver to be effective notwithstanding any negligence of the Authority, its Commissioners, officers, agents, employees, consultants or contractors. The Contractor shall procure the same agreement from any other owners of equipment which may be used in the performance of the Contract, including equipment rented by the Contractor as agent for the Authority, and in the event of failure to obtain any such agreement from a subcontractor or others as required herein, the Contractor shall indemnify the Authority for any loss or liability it may be subjected to on account of such failure. The Contractor's risk and his indemnity obligation under this clause may not be covered by any insurance procured by the Authority.

The foregoing waivers shall also be for the benefit of the Commissioners, officers, agents, employees, consultants and contractors of the Authority, so that they shall have all the rights which they would have under this clause if they were named at each place above at which the Authority is named, except however, that the Authority may at any time in its sole discretion and without liability of its part cancel the benefit conferred on them by this clause whether or not the occasion for invoking such waiver has arisen at the time of such cancellation.

38. INSURANCE PROCURED BY AUTHORITY

In order to reduce the cost of the project of which this Contract forms a part, the Authority has procured and will maintain in force and pay the premiums on:

1. A policy of general liability ("premises-operations hazard," "products-completed operations hazard" and "contractual") insurance on which the Contractor and the subcontractors will be insureds, issued by American Home Assurance Company entitled "The World Trade Center - Hudson Tubes Construction Project" and numbered CGB 448 209, including all endorsements issued thereto. Said policy is on file and available for examination in the office of the Insurance Manager of the Authority, Room 1005, 111 Eighth Avenue, at 15th Street, New York City.

2. A policy of Workmen's Compensation and Employer's Liability Insurance to be issued by the New York State Insurance Fund fulfilling the Contractor's and the subcontractors' obligations under the New York State Workmen's Compensation Law for those employees of the Contractor and the subcontractors employed pursuant to this Contract in operations conducted at or from the site of the Work hereunder.

3. Certain Policies which are to be issued by the Employers' Fire Insurance Company and the Employer's Liability Assurance Corporation Ltd., substantially in the forms designated "Builders Risk Policy" dated May 1, 1965, revised as of November 1, 1966, and designated "All Risk Insurance Form", dated February 1965, revised as of November 1, 1966. The Contractor and the subcontractors will be insureds on said policies. Said forms are on file and available for examination in the office of the Insurance Manager of the Authority, Room 1005, 111 Eighth Avenue, at 15th Street, New York City.

The Contractor and subcontractors shall comply with all obligations of Insured under or in connection with said policies.

The Authority shall have the right at its option to procure insurance substituting in whole or in part for that above referred to and to require that the Contractor and the subcontractors obtain themselves insurance substituting in whole or in part for that above referred to, provided always, however, that the Contractor and the subcontractors shall be afforded coverage equivalent to that above referred to and that the Authority shall either pay the premiums on such substitute insurance or reimburse the Contractor and the subcontractors therefor.

However, neither the procurement of the above insurance or any substitute insurance nor the extent of coverage or the limits of liability thereunder shall be construed to be a limitation on the nature or extent of the Contractor's obligations, or to relieve the Contractor of any such obligations, and the procurement of the above insurance is only for the purpose of reducing the cost of the Contract without constituting any representation by the Authority as to the adequacy of the insurance to protect the Contractor against the obligations imposed on him by law (except the New York State Workmen's Compensation Law) or by this or any other Contract.

Notwithstanding any provision of this clause, however, no subcontractor shall be or have the right to be covered under the policies of insurance above referred to until he has been expressly approved in writing by the Engineer, as required under this Contract, and such approval may be withheld, among other reasons, until execution by the subcontractor of agreements affirming his obligations provided in this clause with respect to the above insurance.

The Contractor and the subcontractor shall cooperate to the fullest extent with the Authority in all matters relating to the aforementioned insurance and shall comply with all requirements of any insurance policy procured by the Authority. They shall also at their own expense furnish the Engineer or his duly authorized representative with copies of all payrolls, correspondence, papers, records and other things necessary or convenient for dealing with or defending against any claims and for procuring or administering the aforementioned insurance including furnishing the time of any of their employees, officers, or agents whose presence or testimony is necessary or convenient in any negotiations or proceedings involving such insurance.

The Authority shall be entitled to all returned premiums, dividends and credits which may become payable at any time for any reason whatsoever in connection with the aforementioned insurance. The Contractor hereby assigns to the Authority all such returned premiums, dividends, and credits and the subcontractors shall be deemed to have assigned to the Authority all such returned premiums, dividends and credits by becoming subcontractors under this Contract. The Contractor shall execute and cause the subcontractors to execute any instrument necessary or convenient to evidence the Authority's right to such returned premiums, dividends and credits.

Notwithstanding any payment by the Authority of any insurance premiums, the Authority shall not be deemed the employer of any employees hired by the Contractor or any subcontractor covered by such insurance nor shall it be liable for any of the obligations of such employer.

The provisions of this clause are not intended to create any rights in the Contractor other than rights which may be available to him under said policies themselves, whatever such rights may be. Moreover, the Authority makes no representation or guaranty, either by the provisions of this clause or otherwise, as to the effect of or the comprehensiveness of the coverage under said policies, and no employee or agent of the Authority is authorized to make any such representation or guaranty or to offer any interpretation of or information on said policies. The Contractor warrants and represents that he has examined and is familiar with said policies and that in submitting his Proposal he has relied solely on his own examination and interpretation of said policies and not on any representations or statements, oral or written, of the Authority, its Commissioners, officers, agents, employees, consultants or contractors.

All negotiations and adjustments with the insurer concerning payment for any loss risk of which is borne by the Contractor under this Contract shall be the responsibility of and shall be conducted by the Contractor. The Contractor shall, however, inform the Engineer of the progress of all such negotiations and notify him sufficiently in advance of all meetings thereon so that he or his representatives may attend said negotiations if they so desire.

Payment under said policies for any loss of which the Contractor bears the risk under this Contract shall be made to the Contractor, and any other payments under these policies shall be made to the Authority, except, however, that the Authority may at its option and with or without cause, elect to take any payment under said policies

for a loss to any of its property or for a loss to any Materials title to which has passed or would pass to the Authority under this Contract, and if such option is exercised such payment shall be credited against the Contractor's obligation under this Contract with respect to said loss. In any event, any payment to the Contractor under said policies for a loss to any of the Authority's property or for a loss to any Materials title to which has passed or would pass to the Authority under this Contract shall be held in trust by the Contractor for the benefit of the Authority and shall be applied only to making good said loss or to payment to the Authority as provided below. Such payment to the Contractor shall be held as a separate fund and not mingled with any other funds of the Contractor or any other persons.

If any payment under said policies for any loss whatsoever exceeds the cost of making good said loss, such excess shall be the property of the Authority and if received by the Contractor shall be payable to the Authority upon demand. The Authority shall not, however, be obligated to pay the Contractor the deficiency, if any, between the payment under said policies for any loss whatsoever and the cost of making good said loss. As used herein, "the cost of making good said loss" or words of similar import shall mean the amount which would be paid by the Authority under the clause hereof entitled "Compensation for Extras" if making good said loss were Extra Materials and Extra Work hereunder.

CHAPTER VI

RIGHTS AND REMEDIES

39. RIGHTS AND REMEDIES OF AUTHORITY.

The Authority shall have the following rights in the event the Director shall deem the Contractor guilty of a breach of any term whatsoever of this Contract:

(a) The right to take over and complete the performance of the Contract or any part thereof as agent for and at the expense of the Contractor, either directly or through other contractors.

(b) The right to cancel this Contract as to any or all of the portion yet to be performed.

(c) The right to specific performance, an injunction or any other appropriate remedy.

(d) The right to money damages.

For the purpose of this Contract, breach shall include the following, whether or not the time has yet arrived for performance of an obligation under this Contract: a statement by the Contractor to any representative of the Authority indicating that he cannot or will not perform any one or more of his obligations under this Contract; any act or omission of the Contractor or any other occurrence which makes it improbable at the time that he will be able to perform any one or more of his obligations under this Contract; any suspension of performance of, or absence of progress on, any part of the Contract by the Contractor which makes it improbable at the time that he will be able to perform any one or more of his obligations under this Contract; provided, however, that none of the occurrences excused as provided for in the clause hereof entitled "Extensions of Time" will be deemed a breach of this Contact.

The Authority shall also have the rights set forth above in the event the Contractor shall become insolvent or bankrupt or if his affairs are placed in the hands of a receiver, trustee or assignee for the benefit of creditors.

The enumeration in this clause or elsewhere in this Contract of specific rights and remedies of the Authority shall not be deemed to limit any other rights or remedies which the Authority would have in the absence of such enumeration; and no exercise by the Authority of any right or remedy shall operate as a waiver of any other of its rights or remedies not inconsistent therewith or to estop it from exercising such other rights or remedies.

40. RIGHTS AND REMEDIES OF CONTRACTOR.

Inasmuch as the Contractor can be adequately compensated by money damages for any breach (including a material breach) of this Contract which may be committed by the Authority, the Contractor expressly agrees that no default, act or omission of the Authority shall entitle him to cancel or rescind it or (unless the Engineer shall so direct) to suspend or abandon performance.

41. PERFORMANCE OF CONTRACT AS AGENT FOR CONTRACTOR.

In the exercise of its right to take over and complete the Contract as agent for the Contractor, for which provision is made in the clause hereof entitled "Rights and Remedies of Authority", The Authority shall have the right to take possession of and use or permit the use of any and all plant, materials, equipment and other facilities provided by the Contractor for the purpose of the Contract and the Contractor shall not remove any of the same from the construction site without express permission. Unless expressly directed to discontinue the performance of the entire Contract, the Contractor shall continue to perform the remainder thereof in such manner as in no way will hinder or interfere with the portions taken over by the Authority.

In the certificate of total compensation earned for the Sale or for the Work, as the case may be, the Engineer shall separately state the portion of the Sale or the Work performed by the Authority as agent for the Contractor, shall credit to the Authority the cost thereof, and shall credit to the Contractor the compensation earned thereby; and the difference between them shall be payable by the Contractor to the Authority, or vice versa, as the case may be. If such difference is in its favor, the Authority may deduct it from any moneys due the Contractor, and if such moneys be insufficient, the balance thereof shall be payable to it on demand; if in the Contractor's favor, it shall constitute part of the Final Payment for the Sale or for the Work, as the case may be.

The exercise by the Authority of its right to take over the Contract shall not release the Contractor from any of his or their obligations or liabilities under this Contract.

42. NO ESTOPPEL OR WAIVER.

The Authority shall not be precluded or estopped by any acceptance, certificate or payment, final or otherwise, issued or made under this Contract or otherwise issued or made by it, the Engineer, or any officer, agent, employee, consultant or contractor of the Authority, from showing at any time the true amount and character of Materials furnished or Work performed, or from showing that any such acceptance, certificate or payment is incorrect or was improperly issued or made; and the Authority shall not be precluded or estopped, notwithstanding any such acceptance, certificate or payment, from recovering from the Contractor any damages which it may sustain by reason of any failure on his part to comply strictly with this Contract, and any moneys which may be paid to him or for his account in excess of those to which he is lawfully entitled.

Neither the acceptance of the Contract or any part thereof, nor any payment therefor, nor any order or certificate issued under this Contract or otherwise issued by the Authority, the Engineer, or any officer, agent, employee, consultant or contractor of the Authority, nor any permission or direction to continue with the performance of the Contract, nor any performance by the Authority of any of the Contractor's duties or obligations, nor any aid lent to the Contractor by the Authority in his performance of such duties or obligations, nor any other thing done or omitted to be done by the Authority, its Commissioners, officers, agents, employees, consultant or contractor shall be deemed to be a waiver of any provision of this Contract or of any rights or remedies to which the Authority may be entitled because of any breach thereof, excepting only a resolution of its Commissioners, providing expressly for such waiver. No cancellation, rescission or annulment hereof, in whole or as to any part of the Contract, because of any breach hereof, shall be deemed a waiver of any money damages to which the Authority may be entitled because of such breach. Moreover, no waiver by the Authority of any breach of this Contract shall be deemed to be a waiver of any other or any subsequent breach.

CHAPTER VII

MISCELLANEOUS

43. SUBMISSION TO JURISDICTION.

The Contractor hereby irrevocably submits himself to the jurisdiction of the Courts of the State of New York and to the jurisdiction of the Courts of the State of New Jersey in regard to any controversy arising out of, connected with, or in any way concerning the Proposal or this Contract. The Contractor agrees that service of process on the Contractor in relation to such jurisdiction may be made, at the option of the Authority, either by registered or certified mail addressed to the office as provided for in the clause hereof entitled "Service of Notices on the Contractor", by registered or certified mail addressed to any office actually maintained by the Contractor or by actual personal delivery to the Contractor if the Contractor be an individual, to any partner if the Contractor be a partnership or to an officer, director or managing or general agent if the Contractor be a corporation.

Such service shall be deemed to be sufficient when jurisdiction would not lie because of the lack of basis to serve process in the manner otherwise provided by law. In any case, however, process may be served as stated above whether or not it might otherwise have been served in a different manner.

44. PROVISIONS OF LAW DEEMED INSERTED.

Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein and the Contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party, the Contract shall forthwith be physically amended to make such insertion.

45. INVALID CLAUSES.

If any provision of this Contract shall be such as to destroy its mutuality or to render it invalid or illegal, then, if it shall not appear to have been so material that without it the Contract would not have been made by the parties, it shall not be deemed to form part thereof but the balance of the Contract shall remain in full force and effect.

46. NON-LIABILITY OF THE AUTHORITY REPRESENTATIVES.

Neither the Commissioners of the Authority nor any officer, agent, or employee thereof shall be charged personally by the Contractor with any liability or held liable to him under any term or provision of this Contract, or because of its execution or attempted execution, or because of any breach hereof.

47. SERVICE OF NOTICES ON THE CONTRACTOR.

Whenever provision is made in this Contract for the giving of any notice to the Contractor, its deposit in any post office or post office box, enclosed in a postpaid wrapper addressed to the Contractor at his office, or its delivery to his office, shall be sufficient service thereof as of the date of such deposit or delivery, except to the extent, if any, otherwise provided in the clause entitled "Submission to Jurisdiction". Until further notice to the Authority, the Contractor's office will be that stated in his Proposal. Notices may also be served personally upon the Contractor; or if the Contractor be a partnership, upon any partner; or if a corporation, upon any officer, director, or managing or general agent.

48. MODIFICATION OF CONTRACT.

No change in or modification, termination or discharge of this Contract, in any form whatsoever, shall be valid or enforceable unless it is in writing and signed by the party to be charged therewith or his duly authorized representative, provided, however, that any change in or modification, termination or discharge of this Contract expressly provided for in this Contract shall be effective as so provided.

The authority of any person to order Extra Materials and Extra Work or to alter the Contract Drawings and Specifications does not include the power to cancel, modify or waive any provisions of the Form of Contract, and no officer or other representative of the Authority shall have the power so to do unless and until hereafter so authorized by or pursuant to a resolution of the Commissioners of the Authority or by or pursuant to a resolution of their appropriate Committee.

SPECIFICATIONS

CHAPTER I

GENERAL PROVISIONS

1. CONSTRUCTION REQUIRED BY THE SPECIFICATIONS

* These Specifications relate generally to the designing, furnishing and installation of elevators, including elevators to be used during actual construction, and escalators and the installation of elevator car enclosures and, unless the Authority exercises the option contained on page A-10 hereof, the furnishing of elevator car enclosures and the furnishing and installation of hoistway entrances, all for the North (Tower A) and South (Tower B) Tower Buildings and for the areas below the Plaza west of Greenwich Street including the PATH underpass, all at the construction site.

These Specifications require the doing of all things necessary or proper for or incidental to the matter referred to in the immediately preceding paragraph, as shown on the Contract Drawings in their present form. In addition, all things shown on the Contract Drawings even though not expressly mentioned in these Specifications, all things mentioned in these Specifications even though not shown on the Contract Drawings or in the Specifications but involved in carrying out their intent and in the complete and proper execution of the matter referred to in the immediately preceding paragraph are required by these Specifications; and the Contractor shall perform the same as though they were specifically delineated, described and mentioned.

In the event that any requirements of the Specifications conflict with the requirements of the Contract Drawings, the requirements of the Specifications shall prevail.

The following listings under headings A and B are furnished for the general information of the Contractor.

A. CERTAIN ITEMS OF SALE AND WORK REQUIRED BY THE SPECIFICATIONS IN ITS PRESENT FORM

1. Elevators as per "Elevator Schedule and Requirements"

2. Escalators as per "Escalator Schedule and Requirements"

3. Elevator Car Enclosures

a. Furnish local passenger elevator car enclosures for Elevators Nos. 24 thru 47 inclusive, and Elevators Nos. 51 thru 98 inclusive in Towers A and B.

*The option was exercised by letter dated May 15, 1968 and is reflected in this conformed book.

b. Furnish shuttle elevator car enclosures for Elevators Nos. 1 thru 4 inclusive, Elevators Nos. 7 thru 16 inclusive, and Elevators Nos. 18 thru 23 inclusive in Towers A and B.

c. Furnish freight elevator car enclosures for Elevators Nos. 48, 49, 50 and 99 in Towers A and B.

d. Furnish shuttle combination elevator (C.E.) car enclosures for Elevators Nos. 5, 6 and 17 in Towers A and B.

e. Furnish elevator car enclosures for Elevators Nos. J-1 thru J-3 inclusive and K-3 thru K-5 inclusive. These elevator car enclosures shall be in accordance with the requirements hereafter specified for local passenger elevators, except for floor finish.

f. Furnish elevator car enclosures for Elevators Nos. J-4, P-1, K-1 and K-2. These elevator car enclosures shall be in accordance with the requirements hereinafter specified for freight elevators.

g. The Contractor shall furnish elevator car protection pads for Freight Elevator Nos. 48, 49, 50, 99, J-4, K-1, K-2, and P-1; for Shuttle Combination Elevator (C.E.) Nos. 5, 6, and 17; "Below Grade" Passenger Elevator Nos. J-1, J-2, J-3, K-3, K-4, and K-5; and twelve (12) sets for local passenger elevators and including furnishing and installing concealed type pad hooks in each elevator car as herein specified.

h. The Contractor shall provide all cut-outs, drilling, punching and reinforcing for all plates, transom panels, wall and ceiling panels to receive installations by Others, with the exception of face plates and wood panels receiving attendant car operating concealed (sliding or hinged doors) panels. The face plates and wood panels in all local passenger elevators (Towers "A" and "B") in Below Grade Passenger Elevator Nos. J-1, J-2, J-3, K-3, K-4, and K-5, and in Shuttle Combination Elevator (C.E.) Nos. 5, 6, and 17 (Towers "A" and "B") to receive the attendant car operating concealed panels shall be delivered by the Contractor to the contractor for Contract WTC-320.00 for incorporation of their installations as required by Contract WTC-320.00. All shipping costs for this item shall be borne by the Contractor, including the furnishing and installing all reinforcements, and the finishing and fitting for this Contract.

i. The Contractor shall furnish and provide all cab door reinforcing hardware and cut-outs to receive door operators, door hangers, door interlocks and the like to be furnished and installed by others.

j. The Contractor shall furnish and install elevator car certificate frames, capacity plates and car identity plates as directed by the Engineer.

k. The Contractor shall provide all photo engraved numerals and lettering for car head indicators, certificate frames (if required), capacity plates and car identity plates where required by the Contract Drawings and as approved by the Engineer.

l. The Contractor shall deliver when required in accordance with the dates set forth in the clause hereof entitled "Times for Completion and Damages for Delay" all elevator car enclosures to their respective lobbies as directed by. the Engineer.

m. By January 1, 1969, the Contractor shall construct at his shop or factory, one complete elevator car enclosure for a local passenger elevator, a freight elevator and a shuttle combination elevator (CE) for the approval of the Engineer. After the Engineer has approved these enclosures, the Contractor shall utilize them as prototypes for the production run of the car enclosures to be furnished under this contract. The foregoing date is predicated upon the Contractor building a mock-up of a partial car two (2) months after receipt of Contract, in accordance with drawings to be furnished by the Authority. Two (2) months after the mock-up is approved, the Contractor shall complete his preparation of detailed approved drawings. Final fabrication shall be accomplished five (5) months after approval of all drawings and finishes.

4. Elevator Hoistway Entrances

a. The Contractor shall furnish and install complete the elevator hoistway entrances of the sizes, design and at the locations herein-after specified and shown on the Contract Drawings. Such elevator hoistway entrances shall include but not be limited to sills, sill brackets, shims, toe guards, dust plates, door frames properly reinforced and anchored, door sub-frames (where required), door panels, struts, facias, hanger supports and covers, sight guards with approved numerals, lettering and hardware, and including all cut-outs, reinforcing and adaptors to receive the work of others.

(1) Furnish and install complete elevator hoistway entrances for elevator Nos. 1 through 99 inclusive, in Tower "A" and in Tower "B" respectively, wherever they occur from Sub-Level No. 5 to the 110th Floor inclusive.

(2) Furnish and install complete "Below-Grade" elevator hoistway entrances for elevator Nos. J-1 through J-4 inclusive, K-1 through K-5 inclusive, and P-1, wherever they occur from Sub-Level No. 5 to 1st Floor Concourse Level inclusive.

(3) Furnish and install complete "Dummy" elevator hoistway entrances located at the 1st Floor Concourse Level Lobby areas between shuttle combination elevator (C.E.) No. 5 and column No. 1005 of Tower "A" building and Tower "B" building, respectively.

(4) Furnish and install all elevator hoistway enclosure fixed wall panels at shuttle elevator entrances located on the 1st floor Concourse Level as designated hereinafter.

B. CERTAIN ITEMS EXCLUDED FROM CONTRACT

1. Items listed in Clause 34 of the Specifications entitled "Work by Others (Elevators)".

2. Items listed in Clause 86 of the Specifications entitled "Work by Others (Escalators)".

3. The following items pertaining to elevator car enclosures shall not be furnished and/or installed by the Contractor:

   a. Furnishing and installing carpeting.

4. The following items pertaining to elevator hoistway entrances shall not be furnished and/or installed by the Contractor:

   a. Swing hollow metal access doors and frames, as required at openings to elevator pits.

   b. Sheet metal angle and/or channel sub-framing occurring over, and wrapping around, edges of gypsum plank wall construction.

   c. Grouting of sills, and jamb and head members of elevator hoistway entrance frames.

   d. Formed sheet metal and/or bent plate steel edge forms at terminations of concrete slabs and other concrete construction.

   e. Marble saddles.

The foregoing Section A., "Certain Items of Sale and Work Required by Contract Drawings and Specifications in their Present Form" is not an exhaustive listing, either as to the Sale and Work as a whole or as to any one type of item mentioned, and does not outline the Sale and Work required by the Specifications and Contract Drawings nor is it intended to limit the effect of the second paragraph of this numbered clause. Accordingly, the provisions of Section A. shall be construed as in aid of and supplemental to, but in no case limiting, impairing or decreasing, the requirements elsewhere set forth with respect to the Sale and Work to be performed.

2. AVAILABLE PROPERTY AND CONTRACTOR'S LOADING DIAGRAMS

In order to facilitate the handling and staging of Materials and equipment for the construction of The World Trade Center, the Authority will rehabilitate an area of Pier 13, North River, approximately 800' x 100' which is located adjacent to West Street at the construction site. The Authority will make available to the Contractor approximately 2,000 sq. ft. of open storage space on the rehabilitated pier, rent free.

Adjacent to the west side of West Street and parallel to the existing West Side Highway, the Authority will construct a temporary by-pass ramp. This temporary by-pass ramp will be used by public traffic, thus eliminating public traffic on West Street adjacent to the construction site and creating one continuous route from Pier 13 to the construction site.

It is presently expected but not guaranteed that the by-pass ramp and the rehabilitated pier will be ready at the time of the first delivery of elevator Materials and equipment. However, the Contractor shall take into account that other contractors will also be using the rehabilitated pier and care shall be taken so as not to interfere or conflict in any way with these other operations.

The Contractor shall submit for the Engineer's approval loading diagrams for all equipment that he proposes to use throughout the North and South Tower Buildings and for all Material storage loads he intends to impose upon the North and South Tower Buildings. The Contractor shall be responsible for insuring that equipment and Material loads do not exceed the Engineer's approved maximum loadings.

Subject to the conditions elsewhere stated herein, those areas of the North and South Tower Buildings to be occupied by the permanent construction for elevators and escalators will be made available to the Contractor upon the commencement of his first operations at the construction site.

Any additional properties which the Contractor desires for his operations under this Contract shall be obtained by him at his own expense.

The Contractor will be permitted to use only so much of the aforesaid areas as is necessary for the performance of the Contract, and he must at all times so conduct his operations as not to encroach upon or block the portions used by others. The Engineer may at any time make joint or exclusive assignments of particuular portions thereof, either to the Contractor or to others, and may take over and use for other purposes any portions which in the opinion of the Engineer, are not required for the performance of the Contract.

The Contractor shall daily clean up the areas made available to him so that they are free at all times of refuse, rubbish, scrap material or debris. Such refuse, rubbish, scrap material and debris shall be stockpiled in a location on each floor to be designed by the Engineer.

3. CONDITIONS AND PRECAUTIONS

Contractors shanties shall be of incombustible construction, shall be equipped with a fire extinguisher and located outside the North and South Tower Buildings and the Plaza area unless otherwise directed by the Engineer. Shanties shall not be utilized as storehouses for motor fuel, compressed gases, red label solvents, adhesives, or other highly flammable materials.

The wearing of hard hats shall be mandatory on this project unless otherwise permitted by the Engineer. For those interior trades which are not subject to an overhead hazard, a well defined path which is free of the hazard of falling objects shall be established by the Engineer and its limits shall be prominently marked to permit entry and egress from the buildings without hard hats.

If it is essential in the opinion of the Engineer to the Contractor's operations to store combustible material within the Towers or in below grade levels, the Contractor shall provide approved temporary fire protection such as fire extinguishers of quantity, size and type as approved by the Engineer.

The Authority will provide sufficient temporary heat to prevent the temperature from falling below 40°F in the machine rooms. The Contractor shall provide at no additional cost to the Authority all other temporary heat necessary for the performance of all phases of the Work. No phase of the Contractor's Work shall be suspended or delayed because of temperature fluctuation. The Contractor recognizes that the Work will be performed during severe winter seasons, that particularly on the upper levels of the buildings it will be extremely cold and that he has the full responsibility for temporary heat required for the performance of the Work under this Contract except as provided in the first sentence of this paragraph.

The burning of wood or other combustible debris at the construction site will not be permitted.

The use of open fires, including open drum, barrel fires or salsmander for heating will not be permitted. The Contractor shall make arrangements for securing at his own expense any heat which may be required by him for the performance of the Contract. The Contractor will only be permitted to use approved kerosene or propane type heaters for temporary heat.

The Contractor shall work with the General Contractor, who shall be selected at a future date, in the following areas:

a. Day-to-day job coordination.
b. Coordination of delivery of Materials, equipment and supplies to the construction site.
c. Coordination of the Contractor's progress schedule with the overall project progress schedule.
d. Coordination of the use of the hoisting facilities that will be provided by others.
e. Coordination of the use of storage areas.

Except as provided herein the Contractor will not be permitted to store any petroleum products or any other flammable materials on the rehabilitated pier or inside any buildings on the construction site. Where permitted by the Engineer, five gallon containers of such flammable materials in approved containers may be stored in locations designated by the Engineer. In addition the Contractor will be permitted to store oil for buffers in 55 gallon drums inside the buildings at the construction site in locations designated by the Engineer. Any deviation from the aforesaid restrictions will only be permitted where a) the Contractor demonstrates to the Engineer that such deviation is essential to the performance of the Work and b) the Contractor obtains the Engineer's approval in regard thereto.

The Authority will provide, without cost to the Contractor, watchmen's services at the construction site and on the rehabilitated pier during off-working hours. The purpose of this service is to safeguard the construction, material and equipment at the construction site and is not intended to relieve the Contractor of his responsibility for providing fire watches during welding and burning operations as well as insuring that his equipment is stored in a secured area.

Smoking on the construction site shall be restricted to areas designated by the Enginner for the purpose.

No requirement of or omission to require any precautions under this Contract nor the furnishing of watchmen's services shall be deemed to limit or impair any responsibilities or obligations assumed by the Contractor under or in connection with this Contract, and the Contractor shall at all times maintain adequate protection to safeguard the public, all persons engaged in the performance of this Contract and all persons engaged in the building of The World Trade Center and shall take such precautions as will accomplish such end without undue interference with the public, or the operations of other contractors or the Authority..

4. CONSTRUCTION SCHEDULING AND CONTROL -- CRITICAL PATH METHOD

The Contractor shall utilize the Critical Path Method (herein sometimes referred to as CPM) to establish his construction plans and reflect the current status of the construction. In addition, to facilitate monthly advances, the Contractor shall allocate the lump sum Sale and Work prices to activities and in amounts approved by the Engineer.

A. The CPM networks consisting of 18 drawings prepared by the Contractor and approved by the Engineer prior to execution of this Contract are hereby made a part, except that items between restraints are not approved, hereof. These drawings are generally entitled Contract WTC 320.00 The World Trade Center - CRITICAL PATH NETWORK - OTIS ELEVATOR COMPANY and separately titled, numbered and dated as follows:

Zone 1	Bank "A"	Drawing	Exhibit	"A"	Dated 6/9/67
"	Bank "B"	"	"	B	"
"	Bank "C"	"	"	C	"
"	Bank "D"	"	"	D	6/9/67
Zone 2	Bank "A"	"	"	E	6/20/67
"	Bank "B"	"	"	F	"
"	Bank "C"	"	"	G	"
"	Bank "D"	"	"	H	"
Zone 3	Bank "A"	"	"	I	"
"	Bank "B"	"	"	J	"
"	Bank "C"	"	"	K	"
"	Bank"D"	"	"	L	"
Zone 2	Shuttle	"	"	M	"
Zone 3	Shuttle	"	"	N	6/20/67
Below grade elevators and escalators, Tower escalator and car #99			"	O	4/18/67
Freight Car	#48	Drawing	Exhibit	P	6/20/67
"	#49	"	"	Q	"
"	#50	"	"	R	6/20/67

B. The Contractor shall prepare a CPM network for Tower "B" which shall be a direct image of the Tower "A" network except that each date shall be generally 225 days later. After such network is approved by the Engineer it shall be deemed a part hereof and subject to all the provisions of this Contract.

C. The schedules entitled "Billing Schedules - Conforming to Critical PATH Network for Elevator Installation" prepared by the Contractor and approved by the Engineer prior to execution of this Contract are hereby made a part hereof.

D. The schedules entitled "Billing Schedules - Conforming to Critical PATH network for Escalator Installation" prepared by the Contractor and approved by the Engineer prior to execution of this Contract are hereby made a part hereof.

E. The schedule entitled "Unit Prices for Major Components Required for Billing Pre-Manufactured Materials" prepared by the Contractor and approved by the Engineer are hereby made a part hereof.

Within 45 days after execution of this Contract, the Contractor shall prepare and submit to the Engineer a more detailed CPM network for each elevator or escalator upon which shall be shown in greater detail essentially the same information as appears on the foregoing drawings. Thereafter, the Contractor shall promptly make such revisions to the detailed CPM networks as may be required to obtain the approval of the Engineer. Thereafter, no changes shall be made therein except with the approval of the Engineer.

F. Data processing services required for analysis of the network diagrams will be provided by the Authority without expense to the Contractor. These services do not include Contractor payrolls or other reports not directly concerned with the Critical PATH Method. The data processing procedures will be based upon the present Authority electronic data processing system, which system was examined by the Contractor prior to execution of this Contract. Data processing services will be conducted monthly, except that they will be conducted more frequently when warranted in the opinion of the Engineer.

The Contractor shall be responsible for the accuracy of the information sheets which the Contractor shall submit to the Engineer on the forms to be furnished by the Authority, which forms will be substantially the form indicated on the annexed sheets numbered "PA 2823/4.67; PA 2820/4.67; PA 2821/2.67 and PA 2822/4.67." These forms will be prepared by the Authority initially based on information furnished by the Contractor, submitted to the Contractor for vertification as to accuracy and then are submitted by the Contractor as provided in the preceding sentence. Data processing reports will provide for network schedule and cost analysis on a calendar day basis.

The Engineer will furnish one copy of the data processing reports to the Contractor for his use in analyzing the schedule and costs for accuracy. Within 3 days after receipt of such report, the Contractor shall submit written confirmation indicating his concurrence with the data processing information along with changes or exceptions that may be appropriate.

G. Up-dating and Changes of Approved Networks

The CPM networks and schedules shall be continually reviewed and used concurrently as a working tool by both the Contractor and the Engineer.

Coordination meetings to up-date the networks and schedules shall be held on a specified day of each week. The meetings shall be attended by the Engineer, the Contractor's General Superintendent and representatives of such subcontractors and suppliers as the Contractor may deem advisable and appropriate staff.

At these weekly coordination meetings, a detailed review shall be made of the previous week's progress; the current status of the Contract; and proposed solutions for problem areas along with any required modifications of the next week's schedules in order to meet the Contract's objectives. The need for additional up-dating computer analysis of the CPM networks, other than regularly scheduled quad-weekly, will be determined by the Engineer.

Every fourth week, at the coordination meetings, on a schedule to be established by the Engineer, the CPM networks shall be revised by the Contractor to make them accurately represent the Contract as it is actually being performed.

The latest available electronic data processing reports shall also be reviewed jointly at the weekly meetings for the purpose of establishing actual start dates, actual completion dates, planned starts and finishes, quantities installed, per cent complete, etc.

The Contractor shall be prepared to furnish any other information the Engineer may require for use in scheduling and up-dating including but not limited to the following:

a. Work duration charts, equipment schedules and overall manpower loading charts.

b. List of those activities which require multiple shifts or overtime in order to maintain the approved schedule.

A single summary network shall also be up-dated, monthly the Contractor. The summary network shall consolidate all the individual networks by major restrictions. In all cases, analysis and data processing shall be performed on the basis of one integrated network.

Changes to the network shall be made by revisions which shall be entered on the Initial/Change form furnished by the Authority. Within seven(7) calendar days after the meeting, revised network

diagrams will be prepared by the Contractor and a computer print-out available for review at the next coordination meeting.

H. Extension of Time

If the Contractor has complied with the provisions of the clause of the Form of Contract entitled "Extensions of Time" and the Engineer should determine that the Contractor is entitled to an extension of time, subject to the provisions of the clause entitled "Extensions of Time", such an extension will be granted. The Contractor shall incorporate the time extension into the current CPM Program and made such logic changes and cost allocations as may be required and obtain approval of the Engineer thereof.

Nothing contained in this clause and no programs, meetings, actions, approvals, statements, orders or other things in connection with this clause shall limit, affect, or impair the Contractor's obligation to complete the various parts of the construction in accordance with the requirements of the clause of the Form of Contract entitled "Times for Completion" and such requirements shall be controlling in all cases even though inconsistent with any such programs, meetings, actions, approvals, statements, orders or other things in connection with this clause. No extensions of time for completion required by said clause entitled "Times for Completion" shall be inferred from any such programs, meetings, actions, approvals, statements, orders or other things, and an extension of any time for completion required by said clause entitled "Times for Completion" shall be due only as provided in the clause of the Form of Contract entitled "Extensions of Time". No such programs, meetings, actions, approvals, statements, orders or other things in connection with this clause shall be construed as a request by the Contractor for an extension of the times for completion required by said clause entitled "Times for Completion" and such a request shall be deemed made only if it complies with the requirements of said clause entitled "Extensions of Time". No programs, meetings, actions, approvals, statements, orders or other things in connection with this clause including the inclusion as a part of this Contract of the networks prepared by the Contractor and approved by the Engineer shall be deemed a representation by the Authority or the Engineer that the Contractor can or will be permitted to follow a particular schedule or sequence of operations or that by following the Critical PATH Method program he can or will complete the performance of the Sale of Work by the times required by said program or required by said clause entitled "Times for Completion".

The performance of the Sale of Work by the times required by the clause of the Form of Contract entitled "Times for Completion"

after taking into account extensions to which the Contractor may be entitled, may require the use by the Contractor of overtime labor, additional shifts or additional plant and equipment and other measures. Such additional labor, shifts, plant and other measures shall be used by the Contractor without additional compensation even though the CPM networks and schedules do not indicate them to be necessary.

5. OPERATIONS OF OTHERS

During the time that the Contractor is performing the Contract, other persons will be engaged in other operations on or about the construction site including the construction of foundations, erection of steel, exterior skin, installation of mechanical and electrical systems and other construction activities required for the construction of The World Trade Center and continued pedestrian and vehicular traffic and operation of the PATH tubes and various subway systems.

The Contractor shall so plan and conduct his operations as to work in harmony with others engaged at the construction site and not to delay, endanger or interfere with the operations of others (whether or not specifically mentioned above), all to the best interests of the Authority and the public and as may be directed by the Engineer.

6. CONSTRUCTION PERSONNEL AND MATERIAL ELEVATORS

The Contractor shall provide elevator service for construction personnel and construction materials in accordance with the attached temporary elevator schedule.

In the event that manpower requirements as indicated drop below those forecasted on Dwg. SCH-P-PPR-0-0-30, the elevator schedule shall be adjusted subject to the approval of the Engineer. If additional elevators are desired, they shall be paid for in accordance with prices provided in the clause of the Form of Contract entitled "Unit Prices."

Any adjustment shall provide service sufficient to distribute all men to their places of work within a maximum of 30 minutes from starting time and to transport all men to grade level from their places of work within a maximum of 30 minutes of quitting time. In no case shall it be necessary for the men to walk more than 10 floors to their place of work.

For purposes of temporary elevatoring, Freight Elevator #50 shall not be considered as available for personnel elevator service.

All the following Work is required to be performed by others before temporary elevator service can be furnished. This Work shall be coordinated with the Contractor.

a. Enclose and weather-proof temporary and permanent motor rooms used for temporary operation. Provide access doors with cylinder locks, temporary floors, temporary light in motor room and temporary power, including fused disconnect switches, to all temporary elevator controllers.

b. Provide temporary light and power for all work required for the installation of cars used for temporary operation.

c. Provide enclosed hoistways to meet safety and local code requirements.

d. Furnish and install temporary cab enclosures including emergency exits and temporary hoistway doors with latches to meet code requirements.

e. Provide adequate elevator machine beam supports at each temporary location and, if required, rail and buffer supports where required at temporary locations as directed by the Engineer.

Upon completion of temporary or permanent motor room, temporary light and power and hoistway enclosures, the Contractor shall furnish temporary elevator service in accordance with contractual requirements within four (4) calendar days for temporary cars Nos. 6 and 7, except that steps 2 and 3 on the temporary elevator schedule will require ten (10) working days. Twenty (20) working days shall be required for cars using permanent equipment in permanent locations.

The contractor shall "jump" temporary cars Nos. 6 and 7 on weekends where required to meet the manpower requirements shown on Dwg. # SCH-P-PPR-0-0-30 and shall coordinate same with the General Contractor.

The Engineer will sign the following temporary acceptance form before elevators are turned over for temporary operation but after the Contractor gives written certification that cars have been tested and meet code requirements.

7. TEMPORARY ACCEPTANCE OF CONSTRUCTION ELEVATORS

City New York, N.Y.
TO OTIS ELEVATOR COMPANY Date

The Authority hereby acknowledges that the Contractor has today turned over to the Authority for its possession and use elevator(s) No. which the Contractor is erecting in the World Trade Center.

The Authority agrees to operate these elevators at its own expense and to provide a competent operator in the car. The Contractor is to oil, grease, clean the equipment and furnish necessary supplies, upon the terms and conditions set forth in the separate Maintenance Contract between the Authority and the Contractor for the World Trade Center elevators, provided, however, that prior to completion of twenty elevators in ZoneI, the following shall apply:

1. Standby service for maintenance will be provided during Contractor's normal working hours from Monday through Saturday, inclusive.

2. Callback service will be included at all other hours, Monday through Saturday, inclusive, at no additional cost provided elevator stoppages or malfunctions are the result of normal wear and tear or failure due to the Contractor.

3. On Sundays and all Contractor's regular holidays, the Authority will pay for callback service which shall be computed as under the clause entitled "Compensation for Extras."

The Authority understands their use of the elevators may impose an expense on Contractor for cleaning and reconditioning them on their return. For this expense, the Authority will pay Contractor an extra as computed under the clause entitled "Compensation for Extras".

This Temporary Acceptance shall not affect the terms of the Contract between the Authority and the Contractor and shall be subject to all the provisions thereof, and may be revoked by the Authority upon twenty-four hours notice in writing. The agreement between the Authority and the Contractor to furnish supplies or care of the elevators for a period of twelve months is not to commence until the signing of the final acceptance.

Yours very truly,

THE PORT OF NEW YORK AUTHORITY

By _____

SALES NO. _____

CONTRACT WITH _____

TEMPORARY ELEVATOR SCHEDULE
TOWER A

Operations	Steps	Cars	Capacity Lbs.	Capacity People	1/2 Hour Capacity	Speed	Service	M/R Level	Steel To
1	1	43	3,500	19	400	300 FPM	C-5	7	12
2	2	6	8,000	45	583	500	C-9	12	15
3	3	7	8,000	45	537	500	C-13	16	21
4, 5	4	24, 25	3,500	19	319, (2) 638	500	C-16	18	24
6	5	6	8,000	45	467	500	C-21	24	27
7, 8	6	34, 35	3,500	19	263, (2) 526	500	C-24	26	33
9	7	7	8,000	45	406	500	C-30	33	36
10, 11	8	36, 37	3,500	19	223, (2) 446	500	C-32	34	41
12	9	6	8,000	45	364	500	C-38	41	43
13, 14	10	42, 43	3,500	19	218, (2) 436	600	C-40	42	48
15	11	7	8,000	45	330	500	C-45	48	51
16	12	6	8,000	45	308	500	C-51	54	57
17, 18	13	51, 52	3,500	19	375, (2) 750	500	44-54	56	63
19	14	7	8,000	45	286	500	C-60	63	66
20		1 II Shuttle	10,000	56	501	1,000	C-44	46	66
21, 22	15	61, 62	3,500	19	307, (2) 614	500	44-61	63	69
23	16	6	8,000	45	267	500	C-66	69	72
24		2 II Shuttle	10,000	56	501	1,000	C-44	46	72
25, 26	17	63-64	3,500	19	266, (2) 532	500	44-67	69	75
27	18	7	8,000	45	255	500	C-71	74	77
28, 29	19	69, 70	3,500	19	254, (2) 508	600	44-74	76	83
30		6	8,000	45	239	500	C-77	80	83
31	20	6	8,000	45	227	500	C-83	86	89
32		7	8,000	45	227	500	C-83	86	89
33		5 II Shuttle	10,000	56	501	1,000	C-44	46	89
34, 35	21	76, 77	3,500	19	387, (2) 774	500	78-86	88	95
36	22	6	8,000	45	215	500	C-90	93	98
37		22 III Shuttle	10,000	56	403	1,000	C-78	81	98
38, 39	23	82, 83	3,500	19	324, (2) 648	500	78-93	95	101
40	24	6	8,000	45	202	500	C-98	101	104
41		7	8,000	45	202	500	C-98	101	104
42		21 III Shuttle	10,000	56	403	1,000	C-78	81	104
43, 44	25	88, 89	3,500	19	272, (2) 544	500	78-100	102	109
45	26	6	8,000	45	194	500	C-104	107	Roof
46		7	8,000	45	194	500	C-104	107	Roof
47		20 III Shuttle	10,000	56	403	1,000	C-78	81	Roof
48, 49	27	94, 95	3,500	19	258, (2) 516	600	78-107	109	Roof

WORLD TRADE CENTER
TEMPORARY ELEVATOR SCHEDULE
"TOWER B"

Operations	Steps	Cars	Capacity Lbs.	Capacity People	1/2 Hour Capacity	Speed	Service	M/R Level	Steel To
1	1	44	3,500	19	400	300 FPM	C-5	7	12
2	2	6	8,000	45	583	500	C-9	12	15
3	3	7	8,000	45	537	500	C-13	16	21
4, 5	4	24, 25	3,500	19	319, (2) 638	500	C-16	18	24
6	5	6	8,000	45	467	500	C-21	24	27
7, 8	6	34, 35	3,500	19	263, (2) 526	500	C-24	26	33
9	7	7	8,000	45	406	500	C-30	33	36
10, 11	8	36, 37	3,500	19	223, (2) 446	500	C-32	34	41
12	9	6	8,000	45	364	500	C-38	41	43
13, 14	10	42, 43	3,500	19	218, (2) 436	600	C-40	42	48
15	11	7	8,000	45	330	500	C-45	48	51
16	12	6	8,000	45	308	500	C-51	54	57
17, 18	13	51, 52	3,500	19	375, (2) 750	500	44-54	56	63
19	14	7	8,000	45	286	500	C-60	63	66
20		5 II Shuttle	10,000	56	501	1,000	C-44	47	66
21, 22	15	61, 62	3,500	19	307, (2) 614	500	44-61	63	69
23	16	6	8,000	45	267	500	C-66	69	72
		10 II Shuttle	10,000	56	501	1,000	C-44	47	72
25, 26	17	63-64	3,500	19	266, (2) 532	500	44-67	69	75
27	18	7	8,000	45	255	500	C-71	74	77
28, 29	19	69, 70	3,500	19	254, (2) 508	600	44-74	76	83
30		6	8,000	45	239	500	C-77	80	83
31		6	8,000	45	227	500	C-83	86	89
32	20	7	8,000	45	227	500	C-83	86	89
33		11 II Shuttle	10,000	56	501	1,000	C-44	47	89
34, 35	21	76, 77	3,500	19	387, (2) 774	500	78-86	88	95
36	22	6	8,000	45	215	500	C-90	93	98
37		17 III Shuttle	10,000	56	403	1,000	C-78	81	98
38, 39	23	82, 83	3,500	19	324, (2) 648	500	78-93	95	101
40		6	8,000	45	202	500	C-98	101	104
41	24	7	8,000	45	202	500	C-98	101	104
42		18 III Shuttle	10,000	56	403	1,000	C-78	81	104
43, 44	25	88, 89	3,500	19	272, (2) 544	500	78-100	102	109
45		6	8,000	45	194	500	C-104	107	Roof
46	26	7	8,000	45	194	500	C-104	107	Roof
47		19 III Shuttle	10,000	56	403	1,000	C-78	81	Roof
48, 49	27	94, 95	3,500	19	258, (2) 516	600	78-107	109	Roof

8. CONSTRUCTION HOISTS

The Contractor for structural steel erection under Contract WTC-230.00 will furnish hoisting services for hoisting of the Contractor's equipment under this Contract in accordance with Schedule B entitled "Charges for Hoisting of Equipment" attached hereto and made a part hereof. The Contractor shall make arrangements directly with the aforementioned Contractor providing such hoisting services for such services and for payment based on the rates listed in said Schedule. However, the Contractor may do his own hoisting provided that he first obtains the approval of the Engineer and providing that such hoisting will not interfere with anyone else at the construction site.

9. CONTRACT DRAWINGS

The Contract Drawings which accompany and form a part of these Specifications bear the general title "The World Trade Center, The Port of New York Authority," and are separately numbered, dated and entitled as follows:

Drawing No.	Title	Date	Rev. Da
L-A-1	DRAWING INDEX	5/15/67	None
L-A-2	ZONE I - PIT PLAN BANKS A, B, C & D & FREIGHT ELEVATORS	7/15/66	4/29/6
L-A-3	ZONE I - RISER BANKS A & B - SECONDARY & MACHINE ROOM PLANS	7/15/66	5/1/67
L-A-4	ZONE I - BANKS C & D - SECONDARY & MACHINE ROOM PLANS	7/15/66	5/22/6
L-A-5	ZONE I- - ELEVATIONS BANKS A, B, C & D	7/15/66	5/1/67
L-A-6	ZONE II - PIT PLAN - BANKS A, B, C & D	7/15/66	5/22/6
L-A-7	ZONE II - RISER BANKS A & B - SECONDARY & MACHINE ROOM PLANS	7/15/66	5/2/67
L-A-8	ZONE II - BANKS C & D - SECONDARY AND MACHINE ROOM PLANS	7/15/66	5/22/6
L-A-9	ZONE II - ELEVATION BANKS A, B, C & D	7/15/66	5/22/6
L-A-10	ZONE III- PIT PLAN - BANKS A, B, C & D	7/15/66	5/3/67
L-A-11	ZONE III - RISER BANKS A & D - SECONDARY AND MACHINE ROOM PLANS	7/15/66	5/3/67
L-A-12	ZONE III - BANKS B & C - SECONDARY & MACHINE ROOM PLANS	7/15/66	5/3/67
L-A-13	ZONE III - ELEVATIONS - BANKS A, B, C & D	7/15/66	5/3/67
L-A-14	FREIGHT ELEVATORS 48, 49 & 50 - ELEVATIONS - SECONDARY & MACHINE ROOM PLANS	7/15/66	5/22/6
L-A-15	SHUTTLE ELEVATORS 1-11 - HOISTWAY PLAN	7/15/66	5/5/67
L-A-16	SHUTTLE ELEVATOR - M G ROOMS	7/15/66	5/5/67
L-A-17	ZONE II - SHUTTLE ELEVATORS - SECONDARY LEVEL - FE99 - ELEVATION SECONDARY LEVEL NO6, 7 & FE50	7/15/66	5/22/6
L-A-18	ZONE II - SHUTTLE ELEVATORS - MACHINE ROOM FE99 & MACHINE ROOM FE50	7/15/66	5/22/6
L-A-19	SHUTTLE ELEVATORS 12-23 - HOISTWAY PLAN	7/15/66	5/8/67

L-A-20	ZONE III - SHUTTLE ELEVATORS - SECONDARY LEVEL	7/15/66	5/22/67
L-A-21	ZONE III - SHUTTLE ELEVATORS - MACHINE ROOM	4/1/67	5/22/67
L-A-22	ZONE II & III - SHUTTLE ELEVATORS - ELEVATIONS	7/15/67	5/8/67
L-A-23	SHUTTLE & FREIGHT ELEVATORS - RISER & PILOT VALVE	4/1/66	5/9/67
L-A-24	TOWER ESCALATORS - NOS. A-3 THRU A-10	8/1/66	5/10/67
L-A-25	TOWER ESCALATORS - NOS. A-1 & A-2	8/1/66	5/22/67
L-A-26	TOWER ESCALATORS - PLOT PLAN	4/7/67	5/13/67
L-B-1	DRAWING INDEX	5/15/67	NONE
L-B-2	ZONE I - PIT PLAN BANKS A, B, C & D & FREIGHT ELEVATORS	7/15/66	5/13/67
L-B-3	ZONE I - RISER BANKS A & B - SECONDARY & MACHINE ROOM PLANS	7/15/66	5/1/67
L-B-4	ZONE I - BANKS C & D - SECONDARY & MACHINE ROOM PLANS	7/15/66	5/22/67
L-B-5	ZONE I - ELEVATIONS BANKS A, B, C & D	7/15/66	5/1/67
L-B-6	ZONE II - PIT PLAN - BANKS A, B, C & D	7/15/66	5/22/67
L-B-7	ZONE II - RISER BANKS A & B - SECONDARY & MACHINE ROOM PLANS	7/15/66	5/2/67
L-B-8	ZONE II - BANKS C & D - SECONDARY AND MACHINE ROOM PLANS	7/15/66	5/22/67
L-B-9	ZONE II - ELEVATION BANKS A, B, C & D	7/15/66	5/2/67
L-B-10	ZONE III - PIT PLAN - BANKS A, B, C & D	7/15/66	5/3/67
L-B-11	ZONE III - RISER BANKS A & D - SECONDARY AND MACHINE ROOM PLANS	7/15/66	5/3/67
L-B-12	ZONE III - BANKS B & C - SECONDARY & MACHINE ROOM PLANS	7/15/66	5/3/67
L-B-13	ZONE III - ELEVATIONS - BANKS A, B, C & D	7/15/66	5/3/67
L-B-14	FREIGHT ELEVATORS 48, 49 & 50 - ELEVATIONS - SECONDARY & MACHINE ROOM PLANS	7/15/66	5/22/67
L-B-15	SHUTTLE ELEVATORS 1-11 - HOISTWAY PLAN	7/15/66	5/5/67
L-B-16	SHUTTLE ELEVATOR - M C ROOMS	7/15/66	5/5/67
L-B-17	ZONE II - SHUTTLE ELEVATORS - SECONDARY LEVEL - FE99 - ELEVATION SECONDARY LEVEL NO6, 7 & FE50	7/15/66	5/22/67

L-B-18	ZONE II - SHUTTLE ELEVATORS - MACHINE ROOM FE99 & MACHINE ROOM FE50	7/15/66	5/22/6
L-B-19	SHUTTLE ELEVATORS 12-23 - HOISTWAY PLAN	7/15/66	5/8/67
L-B-20	ZONE III - SHUTTLE ELEVATORS - SECONDARY LEVEL	7/15/66	5/22/6
L-B-21	ZONE III - SHUTTLE ELEVATORS - MACHINE ROOM	7/15/66	5/8/67
L-B-22	ZONE II & III - SHUTTLE ELEVATORS - ELEVATIONS	7/15/66	5/8/67
L-B-23	SOUTH TOWER RISER - SHUTTLE & FREIGHT ELEVATORS - & PLOT PLAN	7/15/66	5/14/6
L-B-24	TOWER ESCALATORS - NOS. A-3 THRU A-10 - DETAILS	7/15/66	5/10/6
L-B-25	TOWER ESCALATORS - NOS. A-1 & A-2 - DETAILS	7/15/66	5/22/67
L-B-26	TOWER ESCALATORS - PLOT PLAN	7/15/66	5/22/6
L-J-1	BELOW GRADE DRAWING INDEX	5/15/67	5/29/6
L-J-2	ELEVATOR DETAILS - ELEVATOR NOS. J1, J2 & J3	9/16/66	5/16/6
L-K-1	ELEVATOR DETAILS - ELEVATOR NOS. K2 THRU K5	9/16/66	5/25/6
L-K-2	ELEVATOR DETAILS - ELEVATOR NOS. J-4, K-1 & P1	9/16/66	5/25/6
L-K-3	ESCALATOR DETAILS - NOS. P-1 TO P-8	9/27/66	4/1/67
L-K-4	ESCALATOR NOS. P-11 THRU P-18; K-1, K-2 & K-3 - DETAILS	10/4/66	5/22/6
L-K-5	ESCALATOR NOS. P-19 THRU P-27, P-9 & P-10 - DETAILS	10/4/66	6/15/6
L-K-6	BELOW GRADE ESCALATOR PLOT PLAN	4/7/67	5/16/6
SCH-P-PPR-0-0-30	MANPOWER REQUIREMENT TO DETERMINE CONSTRUCTION ELEVATORS PER TOWER	8/5/66	NONE
L-AB-1	ELEVATOR HARDWARE	5/26/67	-

Eighty-four C.P.M. drawings for Contract-WTC-320.00 generally entitled "Contract WTC-320.00, The World Trade Center - Port of New York Authority - Critical PATH Network - Otis Elevator Co., N.Y. Region" all dated 9-1-67 and separately numbered as follows:

	Drawing No.		Drawing No.		Drawing No.
(1)	1-A1A-P	(29)	29-A11S-T4	(57)	57-B111C-P
(2)	2-A1A-T	(30)	30-A111S-P	(58)	58-B111C-T
(3)	3-A1B-P	(31)	31-A111S-T1	(59)	59-B111D-P
(4)	4-A1B-T	(32)	32-A111S-T2	(60)	60-B111D-T
(5)	5-A1C-P	(33)	33-A111S-T3	(61)	61-B11S-P
(6)	6-A1C-T	(34)	34-AFE-48	(62)	62-B11S-T1
(7)	7-A1D-P	(35)	35-AFE-49	(63)	63-B11S-T2
(8)	8-A1D-T	(36)	36-AFE-50	(64)	64-B11S-T3
(9)	9-A11A-P	(37)	37-B1A-P	(65)	65-B11S-T4
(10)	10-A11A-T	(38)	38-B1A-T	(66)	66-B111S-P
(11)	11-A11B-P	(39)	39-B1B-P	(67)	67-B111S-T1
(12)	12-A11B-T	(40)	40-B1B-T	(68)	68-B111S-T2
(13)	13-A11C-P	(41)	41-B1C-P	(69)	69-B111S-T3
(14)	14-A11C-T	(42)	42-B1C-T	(70)	70-BFE-48
(15)	15-A11D-P	(43)	43-B1D-P	(71)	71-BFE-49
(16)	16-A11D-T	(44)	44-B1D-T	(72)	72-BFE-50
(17)	17-A111A-P	(45)	45-B11A-P	(73)	73-BG-1
(18)	18-A111A-T	(46)	46-B11A-T	(74)	74-BG-2
(19)	19-A111B-P	(47)	47-B11B-P	(75)	75-ESC-A1
(20)	20-A111B-T	(48)	48-B11B-T	(76)	76-ESC-A2
(21)	21-A111C-P	(49)	49-B11C-P	(77)	77-ESC-B1
(22)	22-A111C-T	(50)	50-B11C-T	(78)	78-ESC-B2
(23)	23-A111D-P	(51)	51-B11D-P	(79)	79-ESC-P1
(24)	24-A111D-T	(52)	52-B11D-T	(80)	80-ESC-P2
(25)	25-A11S-P	(53)	53-B111A-P	(81)	81-ESC-P3
(26)	26-A11S-T1	(54)	54-B111A-T	(82)	82-ESC-P4
(27)	27-A11S-T2	(55)	55-B111B-P	(83)	83-ESC-P5
(28)	28-A11S-T3	(56)	56-B111B-T	(84)	84-ESC-P6

Drawing Number	Title	Dated	Revised
A-X-220	Typical Local Elevator Lobby-Plans and Elevations	7/31/67	
A-X-221	Typical Local Elevator Lobby-Details	7/31/67	
A-X-222	Typical Elevator Cab-Plans and Elevations	7/31/67	2/16/68
A-X-223	Typical Elevator Cab-Details	7/31/67	2/16/68
A-X-224	Freight Elevator Cabs-Plans and Elevations	7/31/67	
A-X-225	Elevator-Accessory Details	7/31/67	
A-X-226	44th Floor Skylobby Plan	7/31/67	
A-X-227	78th Floor Skylobby Plan	7/31/67	
A-X-228	44th Floor Skylobby Elevations	7/31/67	
A-X 229	78th Floor Skylobby Elevations	7/31/67	
A-X-233	Skylobby Main Corridor Details	7/31/67	
A-X-234	Skylobby-Crosscorridor Vestibule and Elevator Lobby Details	7/31/67	
A-X-240	Elevator Shaft Door Frame Details	7/31/67	2/16/68
A-X-251	Main Lobby Concourse Core Plan	7/31/67	
A-X-255	Main Lobby Elevations "E" and "F"	7/31/67	
A-X-256	Main Lobby Elevations "G" and "H"	7/31/67	
A-X-261	Main Lobby Reflected Ceiling Plan and Elevations of Elevator Lobbies at Concourse	7/31/67	
A-X-262	Main Lobby Main Corridor Details	7/31/67	2/16/68
A-X-263	Main Lobby Local Elevator Lobby Details	7/31/67	
A-X-266	Main Lobby Core Wall Plan Details	7/31/67	
A-X-265	Main Lobby Core Wall Sections and Details	7/31/67	

The Contract Drawings do not show all of the details of the Sale and Work and are intended only to illustrate the character and extent of the Sale and Work to be performed. Accordingly, they may be supplemented during the performance of the Sale and Work by the Engineer or by the Contractor subject to the approval of the Engineer to the extent necessary to further illustrate the Sale and Work.

After the Contract has been executed the Contractor will be furnished with a set of reproducible drawings.

10. SHOP DRAWINGS AND CATALOG CUTS AND BROCHURES

The Contractor shall make all shop drawings which may be required in addition to the Contract Drawings or in addition to any other drawings which the Engineer may issue in supplementing the Contract Drawings.

The specific requirements elsewhere set forth in the Specifications for furnishing shop drawings for any particular portion of the Contract shall not limit the obligation of the Contractor to furnish shop drawings for any other portion when so required by the Engineer.

In preparing the shop drawings, the Contractor may adopt a sheet of any reasonable size which best suits his needs, but having adopted such size all sheets thereafter of a similar nature shall be of the same size as that adopted. Each drawing shall have a margin on the top, bottom and right-hand side of one-half inch and on the left-hand side a margin of one and one-half inches.

Before using any shop drawings, the Contractor shall submit one clear legible reproducible transparency and eleven (11) prints to the General Contractor.

The Contractor shall also provide 7 copies of his letter of transmittal with his submissions to the General Contractor. The letter of transmittal and the shop drawings shall clearly identify the submission and indicate the section of the Specifications under which the item is furnished and/or the Contract Drawings to which it applies.

After drawings are received, they will be checked. The General Contractor will then return one print of each drawing and advise the Contractor whether they have been approved or whether they require additions or corrections. If they require additions or corrections the Contractor shall make them and resubmit a new reproducible transparency containing said additions or corrections. The Contractor shall also resubmit the same number of prints and transmittal letters as required in an initial submission. Each drawing shall be corrected as required until the Contractor is advised that the drawing has been approved. All requests for substitution must be made prior to submission of drawing for approval.

The Contractor shall furnish catalog cuts and brochures where specifically required by the Specifications and for other items which the Engineer may deem necessary. The catalog cuts and brochures shall be for "off the shelf items" (e.g.: lighting fixtures, pumps) and shall be submitted to the General Contractor who shall process them as hereinbefore specified for the shop drawings. A flyleaf shall be attached to each catalog cut which indicates the appropriate paragraph of the Specifications under which it is to be furnished. Copies of the letter of transmittal for the catalog cuts shall be handled in the same manner as those specified for the shop drawings.

Before Final Payment for the Work is made, the Contractor shall have furnished to the Engineer one complete set of shop drawings, all clearly revised and brought up to date, showing the permanent construction as actually made. These shop drawings shall be either drawn in ink or tracing cloth or shall be Diazo transparencies on cloth or CB's cloth, from any of which clear prints can be made. These "as built" drawings shall be submitted as the job progresses and as the various phases of the Work under the Contract have been completed. Approval of shop drawings or catalog cuts which are inconsistent with the requirements of the Contract Drawings and Specifications shall not be deemed to waive or change such requirements or to relieve the Contractor of his obligation to perform such requirements, unless the Engineer shall expressly and specifically state that he is waiving or changing such requirements.

The Contractor shall fill in the dates on which he will furnish such shop drawings and catalog cuts in a schedule furnished by the Authority at the time of signing of the Contract. The completed schedule shall be delivered to the Engineer for his approval within ten days after receipt by the Contractor.

All drawings, data, and other papers of any type whatsoever, whether in the form of writing, figures or delineations, which are prepared in connection with this Contract and submitted to the Authority shall become the property of the Authority. Except to the extent that rights are reserved to others under valid patents for which the Authority is not given a license under the provisions of the clause entitled "Workmanship and Materials", the Authority shall have the non-exclusive right to use or permit the use of all such drawings, data and other papers and any ideas or methods represented thereby for any purpose and at any time without additional compensation. No such papers shall be deemed to have been given in confidence. Any statement or legend to the contrary in connection with such drawings, data or other papers and in conflict with the provisions of this paragraph shall be void and of no effect.

The Contractor shall submit elevator and escalator shop drawings as listed below. Such drawings shall include all dimensions and required information for coordination and checking purposes, and shall clearly indicate all Work required by other trades.

It is not the intention of the Authority to restrict the submission to the drawings listed below, as Contract requirements may require additional information and submissions.

Elevator Drawings

Planviews of all hoistways, machine rooms, secondary levels, motor generator rooms, pit levels and elevations taken through each hoistway and machine room which indicate all floors served, pit and overhead clearances, equipment lists and car weight calculations, and special construction requirements shall be submitted. Drawings shall locate and state sizes of all equipment and components, wiring runs, weights of equipment, impact loads, rail loads, elevator live and dead load breakdowns and required clearances. All details of connections and required supports shall be clearly shown.

Fixture Drawings

Drawings indicating all panels and fixtures for car and hall operations, signals, intercommunication, etc., as required by the Specifications shall be specifically prepared for this Contract and shall be submitted indicating all dimensions, locations, connection requirements by other trades, finishes, actual floor designations, special features, etc.

Special and Standard Equipment

In the event of a defect in Materials installed in the permanent construction that interferes with operation of the permanent construction and that the Contractor fails to correct promptly, the Contractor shall submit, if requested, assembly drawings of the equipment involved.

Escalator Drawings

Plan views, general arrangement and elevation drawings of all escalators shall be submitted for approval. Drawings shall include all dimensions required for coordination, reactions, impacts, clearances, etc. Special drawings showing special space conditions, remote machine rooms, balustrade treatments and details, finishes, etc., shall be submitted for approval. Additional drawings required for clarification of specific details shall be submitted when requested.

11. WORKMANSHIP AND MATERIALS

Materials and workmanship shall in every respect be in accordance with the best modern practice and whenever the Contract Drawings, Specifications or directions of the Engineer admit of a doubt as to what is permissible or fail to note the quality of any construction, the interpretation which calls for the best quality is to be followed. Materials to be installed as part of the permanent construction shall be new Materials except as may be otherwise herein specifically required. Materials and workmanship shall be free from defects of any kind. Material furnished by the Contractor and utilized for temporary elevatoring and subsequently utilized in the permanent construction shall be considered acceptable if they meet with all other requirements of this Contract.

Wherever on the Contract Drawings or in the Specifications, a particular brand or make of Material or equipment is shown or specified (and whether or not with the words "or approved equal", "similar and equal to" or words of similar import), any other brand or make which, in the sole opinion of the Engineer, is equal to that shown or specified may be substituted (except where specifically stated otherwise), but only after being submitted to and expressly approved by the Engineer. Notwithstanding such approval, however, the Contractor assumes the risk that such other brand or make is not equal to that shown or specified and if at any time the substitute shall appear not to be so equal he shall replace the substitute and reimburse the Authority for any loss occurring on account of the substitute failing to be so equal. Such submission to the Engineer shall be made only by including the requested substitution in the list of Materials required to be submitted to the Engineer in accordance with the clause hereof entitled "Inspections and Rejections". After the approval of said list, no substitutions will be permitted, except that a brand or make named in the Specifications may be submitted for approval in lieu of a brand or make on said list. Any such submission shall not imply, or impose on the Engineer, any obligation whatsoever to discuss, disclose or justify the reasons for his opinion, approval, acceptance or rejection. Furthermore, the acceptance of any other brand or make shall not in any way entitle the Contractor to additional compensation therefor, but the Engineer may make such reduction in the Contractor's compensation as may be equitably warranted because of such acceptance in lieu of the standard.

The construction called for by the Contract Drawings and Specifications may be adapted for a particular brand or make of Material or equipment. Therefore, if any construction not required by the Contract Drawings or Specifications in their present form is necessary or desirable because of the use of another brand or make of Material or equipment (even though such other brand or make is approved by the Engineer or is mentioned in the Contract Drawings or the Specifications and stated to be acceptable), such construction shall be furnished or performed by the Contractor at his expense and subject to the approval of the Engineer.

In case of a discrepancy between a description or requirement in the Contract Drawings and Specifications for any Material or equipment and a catalog number or other designation for the same Material or equipment (even though stated to be acceptable), the description or requirement shall control.

In various paragraphs of these Specifications, references may be made to certain standard or tentative specifications or requirements of various organizations. Unless otherwise stated, these references are to be construed as referring to the specifications and requirements in effect on the date of submission of the Proposal.

All inventions, ideas, designs and methods contained in the Specifications and Contract Drawings in which the Authority has or may acquire patent, copyright or other property rights are hereby expressly reserved to the Authority. The Specifications and Contract Drawings contain confidential information in regard to hall lanterns, corridor hall button fixtures, car position indicators and car progress indicators (all the foregoing being referred to below as "fixtures") which is disclosed only to enable this Contract to be performed. The aforementioned confidential information must not be used for any purpose detrimental to the interest of the Authority and must not be reproduced or copied as to any or all such fixtures or used for furnishing information to others without the written consent of the Authority, provided, however, that the Contractor may, when the performance of the Contract so requires, furnish said information to others for the purpose of engaging or informing subcontractors and materialmen, and provided further, that such restrictions shall not apply after such information becomes available to the public in general.

If in accordance with this Contract, the Contractor furnishes research, development or consultative services in connection with the performance of the Contract and if in the course of such research, development or consultation an invention is produced by the Contractor, its officers, employees (excepting only those employees of the Contractor not under an obligation to assign patent rights to the Contractor), subcontractors or materialmen, on which invention the Contractor, subcontractor or materialmen acquires patent rights then the Authority shall have, without cost or expense to it, an irrevocable, non-exclusive, royalty-free license to make, have made and use, either itself or by anyone on its behalf such invention in connection with an elevator or escalator installation on any real property now or hereafter owned or operated by or leased to the Authority whether occupied by the Authority or another; provided, however, that in the case of an invention produced by a materialman, the foregoing obligations of the Contractor shall be limited to apparatus for which the Contractor supplied plans, specifications or performance requirements to the materialmen. Promptly upon request by the Authority, the Contractor shall furnish or obtain from the appropriate person a form of license in accordance with this clause, but as between the Contractor and the Authority the license herein provided for shall nevertheless arise for the benefit of the Authority immediately upon the production of said invention and shall not await formal exemplification in a written license agreement as provided for above. Such license may be transferred by the Authority to its successors, immediate or otherwise, in the operation or ownership of any real property now or hereafter owned or operated by the Authority, but such license shall not be otherwise transferable.

The right to use in the World Trade Center all patented material, compositions of matter, manufacture or types of construction supplied or used in the performance of this Contract (excepting only the patent rights, if any, necessary to use hall lanterns, corridor hall button fixtures, car position indicators and car progress indicators) whether the same is patented before, during or after performance of the Contract is hereby given by the Contractor to the Authority or shall be obtained by the Contractor for the Authority without separate or additional compensation. In addition, the Contractor hereby gives to the Authority the right to make, have made and use any such patented material, compositions of matter, manufacture or types of construction supplied or used in the performance of this Contract, but subject to the above exception, in connection with any future replacements of Materials furnished under this Contract when and to the extent that such right is, now or hereafter, possessed by the Contractor. In regard to Materials obtained by the Contractor, in accordance with plans, specifications or performance requirements designated by the Contractor, from materialmen and subcontractors, the Contractor, without separate or additional compensation therefor, agrees that its purchase contracts and its subcontracts shall provide that said materialman or subcontractor, as the case may be, agrees that the Authority shall have the right to make, have made and use any material, compositions of matter, manufacture or types of construction furnished under such purchase contract or subcontract when used in any future replacements of Materials supplied in accordance with said purchase contract or subcontract free of claim of patent infringement asserted by said materialman or subcontractor, as the case may be, or a subsequent assignee or licensee of either.

The Contractor shall indemnify the Authority against and save it harmless from all (1) expense incurred in the defense, settlement or satisfaction of any claim for patent infringement asserted against any material, compositions of matter, manufactures, apparatus, appliances, processes of manufacture or types of construction (excepting only indemnity in regard to hall lanterns, corridor hall button fixtures, car position indicators and car progress indicators), supplied or used in the performance of this Contract or supplied or used by the Contractor in any future replacement of any apparatus or material originally supplied under this Contract, and (2) rental loss on account of any injunction issued in connection with such claim. The obligation expressed in the preceding sentence is expressly conditioned upon the Authority notifying the Contractor promptly after receipt by the Authority of any notice of claim asserting patent infringement. The Contractor shall promptly thereafter notify the Authority whether it elects to defend such claim on behalf of the Authority. If the Contractor does so elect, the Authority shall not incur expenses without the Contractor's authorization therefor and the Contractor shall have the sole right and the obligation to conduct all negotiations with respect to and defend or settle such claim, without expense to the Authority, provided that no settelement shall reduce or impair the Contractor's obligations provided for under this clause or elsewhere in this Contract. The obligation of the Contractor to indemnify the Authority for "rental loss" as set forth in the first sentence of this paragraph is conditioned upon the Authority being enjoined from using the infringing facilities and the claim for infringement being upheld or settled. If the Authority be enjoined from using any of the facilities which form the subject matter of this Contract and as to which the Contractor is to indemnify

the Authority against patent claims the Contractor shall at its own cost and expense (a) procure for the Authority the legal right to continue using said facilities; or (b) modify said facilities so as to make them non-infringing; or (c) replace said facilities with facilities not infringing any patent. The Contractor may at its option determine which of the foregoing three measures shall be adopted provided that in any case: 1) it shall act promptly, 2) any modification or replacement shall still be in accordance with the requirements of this Contract, and 3; the Authority shall have the option of requiring the Contractor to remove any facilities subject to an injunction at the Contractor's expense and to refund the cost thereof to the Authority provided the Contractor does not promptly perform his obligations under the immediately preceding sentence.

12. INSPECTIONS AND REJECTIONS

All construction, processes of manufacture and methods of construction shall be at all times and places subject to the inspection of the Engineer, acting personally or through his Inspectors. The Engineer shall be the judge of the quality and suitability of the construction, processes of manufacture and methods of construction for the purposes for which they are used. Should they fail to meet his approval they shall be forthwith reconstructed, made good, replaced or corrected, as the case may be, by the Contractor at his own expense. Rejected Material shall be removed immediately from the site. The fact that the Inspectors have accepted the Material and workmanship shall not relieve the Contractor from his obligation to supply other Material and workmanship when so ordered by the Engineer.

The Contractor, at his own expense, shall furnish such facilities and give such assistance for inspection as the Engineer may direct. In the case of Materials required by the Specifications to be inspected in the factory or plant, and in the case of any other items which the Engineer may designate, the Contractor shall secure for the Engineer and his Inspectors free access to all parts of such factories or plants and shall furnish to the Engineer three copies of shipping statements for Materials and equipment sent to the construction site. Moreover, in the case of such Materials to be factory or plant inspected, the Contractor shall give at least fifteen days notice to the Engineer for inspection. The point in the process of manufacture at which inspection shall be made shall be as agreed in advance between the Engineer and the Contractor.

The first two of the shuttle motors shall be tested by coupling the two shuttle motors together and using one shuttle machine for loading the other shuttle machine under test. Forty-eight hours notice shall be given to the Authority prior to the tests.

Other than the Materials and equipment specifically required to be inspected at the manufacturer's factory or plant, all Materials will be inspected at the construction site and any portions thereof which are rejected by the Engineer shall be immediately removed from the construction site by the Contractor and shall be replaced with new Materials by the Contractor at his own expense.

In the case of Materials to be inspected at the construction site for which drawings were previously approved, the Contractor shall submit a list of all such Materials in triplicate to the Engineer.

a. In the case of fabricated Materials for which shop drawings were prepared, a brief description of the Material and the statement "see shop drawings".
b. In the case of Material or equipment listed in manufacturer's catalogs, the list shall contain the vendor's name, the manufacturer's name, brand name, style designation, catalog number and, where the Specifications require catalog cuts, the statement "see catalog cut".
c. In the case of Material or equipment for which shop drawings are not prepared and are not listed in any catalog, the list shall identify the Material contained therein.

It is not the intent of the foregoing paragraphs to require the Contractor to identify commercial hardware. Should Material or equipment for which Drawings were not previously approved be delivered to the construction site without having been placed on the aforementioned list and approved, it shall be immediately removed from the construction site by the Contractor at his own expense.

13. MANUFACTURERS' CERTIFICATION

Where Materials and equipment are required by these Specifications to conform to certain standard or tentative specifications or requirements of any organizations, including American Society for Testing and Materials, American Standards Association, Association Rules for Grading Lumber, Federal Specifications, National Electrical Manufacturers Association, American Association of State Highway Officials, American Water Works Association and the International Municipal Signal Association, the Contractor shall furnish to the Engineer the manufacturer's written certification that each of the Materials or equipment conforms to the foregoing standard or tentative specifications. The certification shall be delivered to the Engineer prior to installation of the Materials to which it refers. Such certifications shall not be binding or conclusive on the Authority and may be rejected at any time by the Engineer if incorrect, improper or otherwise unsatisfactory in his opinion.

14. APPROVALS BY ENGINEER

Any approval by the Engineer of any Materials, workmanship, plant, equipment, drawings, program, methods of procedure, or of any other act or thing done or furnished or proposed by the Contractor to be done or furnished in or in connection with the performance of the Contract shall be construed merely to mean that at that time the Engineer knows of no good reason for objecting thereto; and no such approval shall release the Contractor from his full responsibility for the accurate and complete performance of the Contract in accordance with the Contract Drawings and Specifications or from any duty, obligation or liability imposed upon him by the Contract or from responsibility for injuries to persons or damage to property.

15. ERRORS AND DISCREPANCIES

If, in the performance of the Contract, the Contractor discovers any errors or omissions in the Contract Drawings or Specifications, or in the marks, lines and elevations furnished by the Authority or in the construction undertaken and executed by him, he shall immediately notify the Engineer and the Engineer shall promptly verify the same. If with the knowledge of such error or omission and prior to the correction thereof, the Contractor proceeds with any construction affected thereby, he shall do so at his own risk and the construction so done shall not be considered as construction done under and in performance of this Contract unless and until approved and accepted.

16. ACCIDENTS AND FIRST AID PROVISIONS

The Contractor shall promptly report in writing to the Engineer and to the Authority's Claims Attorney all accidents whatsoever arising out of or in connection with the performance of the Contract, whether on or adjacent to the construction site, which result in death, injuries or property damage, giving full details and statements of witnesses. In addition, if death or serious injuries or serious damage is caused, the accident shall be reported immediately by telephone to both of the said representatives of the Authority.

The Authority will provide at the construction site such equipment and medical facilities as are necessary to supply first aid service, in case of accident, to any who may be injured in the progress of the Contract. Standing arrangements have been made for the removal and hospital treatment of any person who may be injured while engaged in the performance of the Contract.

If any claim is made by any third person against the Contractor or any subcontractor on account of any accident, the Contractor shall promptly report the fact in writing to the aforementioned representatives of the Authority, giving full details of the claim.

17. SAFETY AND SANITARY PROVISIONS

In the performance of the Contract, the Contractor shall exercise every precaution to prevent injury to persons or damage to property. He shall, at his own expense, place such fire watchmen, exercise such precaution against fire, adopt and enforce such rules and regulations, and take such other precautions as may be necessary, desirable or proper, or as may be directed by the Engineer.

All reasonable precautions for fire prevention shall be exercised during the performance of the Contract. At all times the Contractor shall provide temporary fire protection such as fire extinguishers of the quantity, size and type as approved by the Engineer.

Before the Certificate of Completion of Work will be issued, the Contractor shall remove all surplus materials, falsework and other temporary structures, including foundations thereof, plant of any description and debris of every nature resulting from his operations and shall put the construction site in a neat, orderly condition.

The Contractor shall perform this Contract in accordance with his safety program entitled "World Trade Center Safety Otis Elevator Company" attached hereto and made a part hereof.

18. DAILY PROGRESS, EQUIPMENT AND LABOR REPORTS

The Contractor shall furnish to the Engineer at the end of every other day, a memorandum showing for that day (a) a general statement of the construction performed (b) the major items of the equipment used, (c) a statement of any unusual happening that occurred, and (d) the number of men in each trade classification that were employed. Such memorandum shall not be deemed to be a substitute for the notices, time slips, memoranda or other data required under the clauses of the Form of Contract relating to compensation for extras.

19. LAWS AND ORDINANCES

In order to effectuate the policy of the Authority, the Contractor shall comply with all provisions of federal, state, municipal, local and departmental laws, ordinances, rules, regulations and orders which would affect the Contract and the performance thereof and those engaged therein if said Contract were being performed for a private corporation, whether or not a reference to such provisions are contained in the Specifications or Contract Drawings, except where stricter requirements are contained in the Specifications or Contract Drawings. However, he shall not apply for any permits or licenses in the name of or in behalf of the Authority.

20. IDENTIFICATION

No person will be permitted on or about the construction site without a pass, permit or identification badge approved by the Engineer. The Contractor shall obtain such passes, permits or identification badges for his employees, subcontractors and materialmen whenever necessary. Identification badges shall be worn in conspicuous and clearly visible position by all employees of the Contractor whenever they are working at the construction site.

21. SIGNS

No advertisement or sign, other than the name and address of the Contractor, will be permitted on any fences, temporary structures or elsewhere on the construction site and such advertisement will be permitted only upon the condition that it is first approved by the Engineer. In any event, the advertisement shall not exceed six feet by eight feet in overall dimensions.

22. CONTRACTOR'S FIELD OFFICE AND REPRESENTATIVE

At a readily accessible point on or near the construction site, the Contractor shall maintain a field office provided with a telephone.

During the performance of any Work at the construction site, the Contractor shall have a representative thereat who shall be authorized by the Contractor to receive and put into effect promptly all orders, directions and instructions from the Engineer. The Contractor's representative shall be provided, at all times, with a conformed copy of this Contract and a set of the Contract Drawings.

Orders and directions may be given orally by the Engineer and shall be received and promptly obeyed by the Contractor or his representative or any superintendent or foreman. A confirmation in writing of such orders or directions will be given by the Engineer when so requested by the Contractor.

23. SURVEYS

The Engineer shall establish a bench mark and a North-South and an East-West base line at each floor. All other grades, lines, levels and bench marks shall be established and maintained by the Contractor. The Contractor shall carefully preserve any base line and bench mark established by the Engineer.

The Contractor shall perform all surveys which may be required by the Engineer for the performance of the Contract. The Contractor shall further lay out and maintain locations, levels and limits of the Work as required while the Contract progresses. In addition, the Contractor shall furnish to the Engineer, without additional compensation therefor, any and all information and data regarding points, lines, grades, elevations and other survey information established by the Contractor during the performance of the Contract.

24. TEMPORARY STRUCTURES

The Contractor shall design, furnish and construct all staging falsework, scaffolding and other temporary structures required in the performance of the Contract, whether or not of the type enumerated. All such temporary structures shall be of adequate strength for the purposes for which they are constructed and the Contractor shall maintain them in a satisfactory condition. Although the designs for such structures are to be prepared by the Contractor, they shall nevertheless be submitted to the Engineer for his approval before being used. Neither such approval, however, nor any requirements of the Engineer, the Specifications or the Contract Drawings shall relieve the Contractor of his responsibility for the design, construction and use of the temporary structures or from any obligations and risks imposed on him under this Contract, and any such approval or requirements shall be deemed merely to relate to minimum standards and not to indicate that the temporary structures are adequate or that they meet the Contractor's obligations under this Contract.

Upon completion of all other Work under this Contract, the temporary structures shall be removed from the construction site and disposed of by the Contractor.

25. UTILITY SERVICES

The Authority will install and maintain all construction lighting, lamps, receptacles, sockets, switches, feeders and conduit to provide artificial illumination and necessary construction power for performance of the Work under this Contract.

The Authority will further provide water supply for the Contractor and will also provide sanitary toilet facilities for all personnel employed on the Work.

26. PERMIT AND REQUIREMENTS FOR WELDING

Prior to the commencement of any cutting or welding operations at the construction site, the Contractor shall notify the Engineer and obtain an Authority cutting and welding permit. The Authority will issue this permit without payment of a fee, and application forms may be obtained from the Contract Clerk in Room 300 in the Port Authority Building, 111 Eighth Avenue, New York, New York 10011 or from any Resident Engineer of the Authority, at his office at the facility. Unless otherwise approved by the Engineer, all cutting and welding operations shall be performed in accordance with the conditions which form a part of said permit. The permit application must be filled out and submitted in duplicate to the Engineer at least forty-eight hours prior to commencing welding or cutting operations at the construction site. Permits will be required for each separate operation and will be valid for only six months.

27. FINAL INSPECTION

When, in the opinion of the Contractor, the construction is completed and ready for final inspection, he shall so notify the Engineer in writing and the Engineer will give said construction (including any portions with respect to which Certificates of Partial Completion have been issued) a minute and thorough inspection. Before any Certificate of Completion will be issued, any defects or omissions noted on this inspection must be corrected by the Contractor.

28. GUARANTEES

The Specifications may provide for certain guarantees of portions of the permanent construction. Although such guarantees shall be enforceable as provided, no requirement of this Contract with respect to guarantees by the Contractor shall be deemed to be a limitation upon any rights which the Authority would have, either expressed or implied, in the absence of such guarantees, the said guarantees being given only for the greater assurance of the Authority.

29. AVAILABLE DOCUMENTS

Certain documents are available for reference and examination by the Contractor. These documents are located in the office of the Engineer (Room 300, 111 Eighth Avenue, New York, New York) during regular business hours. These documents are as follows:

a) A set of architectural drawings which bear the general title "The World Trade Center - The Port of New York Authority - Tower A", are dated 12/18/67, and are separately numbered as follows:

A-A-1	thru	A-A-6	inclusive
A-A-8	thru	A-A-20	"
A-A-20A			
A-A-21	thru	A-A-35	"
A-A-37	thru	A-A-60	"
A-A-63	thru	A-A-118	"
A-A-121	thru	A-A-166	"
A-A-169	thru	A-A-176	"
A-A-261	thru	A-A-267	"
A-A-301	thru	A-A-324	"

b) A set of structural drawings which bear the general title "The World Trade Center - The Port of New York Authority - Tower A", are dated 9/12/66, and are separately numbered as follows:

SA-1	thru	SA-2	inclusive	dated	11/15/67
SA-3	thru	SA-8	"	"	7/28/67
SA-9	thru	SA-17	"	"	9/29/67
SA-18				"	7/28/67
SA-20				"	7/28/67
SA-25	thru	SA-29	"	"	7/28/67
SA-32	thru	SA-36	"	"	7/28/67
SA-40	thru	SA-44	"	"	7/28/67
SA-47	thru	SA-48	"	"	7/28/67
SA-49	thru	SA-51	"	"	10/2/67
SA-52				"	9/12/66
SA-53	thru	SA-59	"	"	9/15/67
SA-63	thru	SA-82	"	"	9/15/67
SA-83	thru	SA-85	"	"	10/2/67
SA-86				"	9/12/67
SA-87	thru	SA-92	"	"	10/5/67
SA-95	thru	SA-98	"	"	10/5/67
SA-100				"	10/5/67
SA-102	thru	SA-105	"	"	10/5/67
SA-109	thru	SA-112	"	"	10/5/67
SA-113	thru	SA-120	"	"	7/20/67
SA-122				HOLD	
SA-124				dated	10/20/67
SA-125				dated	4/7/67
SA-126				"	5/8/67
SA-127				"	4/7/67
SA-128				"	5/8/67
SA-140	thru	SA-143	inclusive	"	4/12/67
SA-151	thru	SA-152	"	"	11/15/67
SAB-156	thru	SAB-157	"	"	10/18/67
SAB-158				"	11/6/67
SAB-159	thru	SAB-160	"	"	10/18/67
SAB-161				"	11/6/67
SAB-162				HOLD	
SAB-163	thru	SAB-171	"	dated	11/6/67

The foregoing drawings were not prepared for the purpose of providing information upon the present Contract, but they were prepared for other purposes and they do not form part of this Contract. The Authority makes no representation as to, and shall not be responsible for, their accuracy, completeness or pertinence and, in addition, shall not be responsible for the conclusions to be drawn therefrom. They are made available to the Contractor merely for the purpose of providing him with such information as is in the possession of the Authority, whether or not such information may be accurate, complete, or pertinent or of any value to the Contractor.

WIC I-479-P

WTCJ-479-P

AARON

THE PORT OF NEW YORK AUTHORITY

CONFORMED

PDG
RB

THE WORLD TRADE CENTER

CONTRACT WTC-320.00

ELEVATORS AND ESCALATORS

AUGUST 15, 1967

BOOK III

Note: Revised December 10, 1969 to incorporate WTC-326.00
AKS
SVW

Books I and II, separately bound booklets, also form part of this Contract.

April 1, 1968

ADDENDUM NO. 3

The following changes are hereby made in the contract documents:

a) Furnishing and installing formed struts for all entrances, formed headers and integral hangers, stainless steel fascia on local passenger elevator cars and the omission of the furnishing and installing of hanger covers, tenite shields and floor numerals all as required for the installation of "closed coupled" doors for all Tower "A" and "B" local passenger elevators (total 144) and including "below grade" elevator Nos. J-1, J-2, J-3, K-3, K-4 and K-5 (total 6) in lieu of angle struts and plate headers specified in Section 4.03 (redesignated as Clause 146) - SUB-ASSEMBLIES (Contract WTC-326.00), and in lieu of applied hangers specified in Contract WTC-320.00. The Contractor shall make all necessary modifications to the elevator hoistway entrance door frames hoistway saddle profiles, door operations, interlocks and including all changes or modifications to the elevator hoistway entrance work and elevator car enclosure work required for the complete and proper installation of the "close coupled" doors.

b) Furnishing and installing particle board core back-up in lieu of mineral composition core back-up specified in Section 3.01 (redesignated as Clause 135) - MATERIALS, Paragraph A-5, entitled "WOOD VENEERED PANELS" and Paragraph A-6, entitled "FACED PLYWOOD PANELS".

c) Furnishing and installing front return panels for all local passenger elevator cars (total 144) in Towers "A" and "B" and all "BELOW-GRADE" passenger elevator cars (total 6) in lieu of the "stainless steel astragal binders and meeting edge trim" on meeting edges of all local passenger elevator hoistway entrance doors receiving baked enamel finish, and including the meeting edges of all elevator hoistway entrance doors for Freight Elevator No. 50 which opens into public corridors.

Panels for the above 150 elevator cars shall be #14 gauge stainless steel (No. 4 finish), one piece, hinged swing panel with car operating panel integral in front return. No face plates shall be required. Hinges concealed type, and panel locking devices shall be stainless steel as approved by the Engineer. Panels shall be properly reinforced to receive all hardware, with swing doors flush in return panel. All joints shall be hairline.

* d) On pages 4-12 and 4-13, Section 4.05 (redesignated as pages G-12 and G-13, Clause 148) - HOISTWAY DOORS AND TRANSOMS - delete Paragraphs A-3 and A-3a in their entirety.

* e) Provide conversion varnish finish in lieu of "Permagard" finish for wood veneered panels for all Tower "A" and "B" local passenger elevator cars (total 144), all below grade passenger cars (total 6), and all shuttle cars (total 46).

On page 3-17, in Section 3.08 (redesignated as page F-17, Clause 142) entitled "FINISHES", Paragraph "C" shall be deleted in its entirety and the following new paragraph substituted in lieu thereof:

"C. WOOD VENEERS - All exposed wood veneered panel facing shall receive a factory applied protective coating of SHER-WOOD 900 CONVERSION VINYL SUPER KENVAR "C", as manufactured by the Sherwin-Williams Company or approved equal. Surface preparation, and application of fillers, base and finished coats shall be performed in strict accordance with the manufacturer's recommendations."

* f) Furnish and install complete, as specified in Chapter III (redesignated as Chapter V) of the Specifications, entitled "Elevator Hoistway Entrances", additional elevator hoistway hollow metal entrance doors and steel frames in Towers "A" and "B" at the 3rd, 4th and 5th floors for Shuttle Combination (C.E.) Elevator No. 17 and Freight Elevator No. 49 respectively.

On Page 4-04, in Section 4.02 (redesignated as page G-4, Clause 145) entitled "ELEVATOR HOISTWAY ENTRANCES", sub-paragraph A-12-e, on the second line after the word "only)" insert a comma and add the following new numerals "3rd, 4th and 5th floors", and on page 4-05 (redesignated as page G-5), sub-paragraph A-12-u, on the second line after the words "Concourse Level" insert a "comma" and add the following new numerals "3rd, 4th and 5th floors".

g) Furnish elevator car enclosures for all shuttle elevators one foot five inches higher than required by the Contract Drawings and Specifications in their present form.

h) The Contractor shall submit a fabrication schedule by July 31, 1968 showing the following information:

1. List of items to be furnished.
2. Total number of each item to be furnished.
3. Amount of each item to be furnished each month. Number of months required to fabricate each item. See C.P.M.
4. Name of manufacturer of each item.
5. Scheduled date for start of fabrication of each item.

* This item is reflected in this conformed book.

CHAPTER IV

Elevator Car Enclosures

135. MATERIALS

A. Materials shall meet the following requirements:

1. Stainless Steel shall be Type No. 302 or 304, 18-8, non-magnetic, "AUSTENETIC" stainless steel conforming to A.S.T.M. Specification A-167.

2. Sheet Metal shall be full cold rolled, mechanically leveled, best quality open hearth furniture stock steel, full pickled, double annealed, bonderized and free of rust, scale, pitting or other surface and/or internal defects.

3. Steel for structural shapes, plates and bars, furnished under this Contract shall conform to A.S.T.M. Specification A-36.

4. All Metal gauges shown on the Contract Drawings or specified herein are U.S. Standard gauges. Where no gauges or thickness are shown on the Contract Drawings or specified herein, stainless steel and ferrous metals shall be a minimum of No. 16 gauge. Where samples must be matched, metals shall be of same thickness as sample unless otherwise indicated or specified.

* 5. Wood Veneered Panels for Local Passenger Elevator Cars, Shuttle Combination Elevator (C.E.) Cars, and Shuttle Elevator Cars shall consist of an approved mineral composition core of 11/16 inch thickness, hardwood veneer cross-banding of 1/40 inch (minimum) thickness and teak face veneer of 1/40 (minimum) thickness but not greater than 1/28 inch (maximum) thickness. Over-all thickness of paneling shall be 3/4 inch unless otherwise shown or noted on the Contract Drawings.

   a. Panels shall be complete with matching, finished hardwood edge banding of same species as face veneer. Corners shall be mitered.

   b. Face veneer match shall be straight veneer (quarter sawn) balanced, booked sequence matched Architectural grade veneer. Veneer shall be in single length (one piece without horizontal joining) for full height of each panel abutting hardwood edging band.

* See Addendum No. 3, April 1, 1968, attached hereto.

c. Face veneers for all wood veneered paneling shall be as selected by the Engineer from samples made available to the Contractor at the office of the Engineer. Should alternate face veneers be selected by the Engineer as hereinbefore listed under the clause of the Form of Contract entitled "Compensation for Extras" veneer shall conform to the specifications as specified herein.

* 6. Faced Plywood Panels for Freight Elevator Cars enclosures shall be similar in construction to wood veneered panels as hereinbefore specified with the following exceptions:

a. Exposed face shall be covered with 1/8" thick "Tytron" or approved equal as hereinafter specified.

b. Edge banding shall consist of continuous 1/8" thick stainless steel bars extending around all exposed panels edges as shown and noted on the Contract Drawings.

7. Metal Mesh ceiling panels for all Local Passenger Elevators, Shuttle Elevators, and Shuttle Combination Elevators (C.E.) shall be woven wire mesh panels similar to "Ty-Glo" No. 60305 as manufactured by W.S. Tyler Company of Cleveland, Ohio, or approved equal. Samples of ceiling panels shall be on display in the office of the Engineer.

a. All material for Local Passenger Elevators, Shuttle Elevators and Shuttle Combination Elevators (C.E.) shall be chemically bright dipped anodized aluminum.

b. All edge trimming to receive woven mesh panels shall be 1/4" x 3/4" continuous stainless edging, No. 7 finish, of extent, profile and details as shown and noted on the Contract Drawings.

8. Plastic Ceiling Panels shall be 1/8" thick, translucent white, rigid acrylic plastic sheets impervious to discoloration, weighing not less than .75 lbs. per square foot, and having the ability to withstand a continuous surface temperature between 180 and 200 degrees F. and a light transmittance of 79 percent, as approved by the Engineer.

9. Wall and Floor Covering shall be 1/8" thick "Tytron" as manufactured and distributed by the Monsanto Company, St. Louis, Missouri, or approved equal. Materials shall have pre-finished exposed surfaces, and shall be stain resistant, non-absorbent and resilient, and shall require no sealing of surfaces and no waxing. Material shall be highly resistant to abrasions and indentation. Sizes shall be as shown on the Contract Drawings.

* See Addendum No. 3, April 1, 1968, attached hereto.

135. MATERIALS (Continued)

10. Sound Deadening material shall be of the rubberized type, shall be resistant to fire, and shall be of either brush or spray-on consistency.

11. Welding of steel shall conform to the requirements of the Standard Code for Arc and Gas Welding of the American Welding Society. Welding shall be of adequate strength and durability, with jointing tight, flush, smooth and clean.

12. Aluminum shall be similar to Alloy No. 6061-T6 as manufactured by Alcoa or approved equal.

13. Joint Material for use with "Tytron" ceiling covering shall be "Silicone" type compound conforming to the requirements of Federal Specification TT-S-00230 for one-part synthetic rubber base materials.

14. Screws, Bolts, Anchors and other fasteners shall be of approved types, suitable to the conditions encountered, and fabricated of metal similar to that being fastened, and of the same finish as the exposed metal.

15. Paint shall be as follows:

    a. Paint for all steel sub-assemblies, reinforcing and other concealed surfaces shall conform to the current Federal Specification TT-P-86, Type II.

    b. Paint for baked-on enamel finishes shall be an acrylic or other approved type enamel which when applied shall meet or exceed the following:

        (1) Humidity, 100 per cent at 100 degrees F. for 1,000 hours with no film breakdown.

        (2) Salt spray, 20 per cent at 100 degrees F. for 300 hours with no color loss, etching, cracking or blistering.

        (3) Water soak at 100 degrees F. for 1,000 hours with no film breakdown.

        (4) Hardness, shall withstand 500 gm load of a Hoffman Hardness Tester.

        (5) Dry abrasive, shall withstand 600 cycles per mil of finish on a Gardner Abrasive and Washable machine using abrasive boat and No. 220 sandpaper over a felt pad.

136. ELEVATOR CAR ENCLOSURE CONSTRUCTION

A. The following general requirements shall be required for all elevator car enclosure construction:

1. The elevator car enclosure construction shall be such as to produce a rigid cab and one free of squeaks. All elevator car enclosures shall be fabricated in strict conformance with the A.S.E. Code. Wherever Materials are required to be furnished to the contractor for Contract WTC-320.00 for him to perform operations required by said contract, and wherever the contractor for Contract WTC-320.00 performs operations to Materials furnished him by the Contractor, the Materials shall be delivered or the Materials shall be returned, as the case may be, in sufficient time to meet the schedules established in the CPM schedule of Contract WTC-320.00.

2. Shell Walls - except where indicated or noted on the Contract Drawings as being stainless steel, the shell walls of each elevator car shall be constructed of sheet metal of not less than No. 14 gauge thickness.

   a. Shell walls shall be reinforced on the exterior side with structural angles welded to the shell to insure rigidity. Angles shall be located both vertically and horizontally. Except as otherwise shown on the Contract Drawings, vertical angles shall be 1" x 1" x 1/8" in size and shall be spaced on 1'-0" centers on all shell walls.

3. Elevator Car Enclosure Canopies - shall be constructed of No. 12 gauge furniture steel sheet metal securely welded at all corners so as to form a one-piece cover. Canopies shall be reinforced to withstand the distributed weight of not less than two (2) workmen using the canopy as a work platform.

4. Emergency Exits - shall be provided in all elevator cabs of sizes, location and extent as shown and noted on the Contract Drawings:

   a. All cabs - ceiling exits (swing type).

   b. All cabs - (except freight elevator cars for elevators Nos. 49, 50 and 99) - side exits.

      (1) The middle elevator car in each grouping of three elevators shall receive two (2) side exits; all others shall receive one (1) side exit.

c. All side emergency exits shall receive an approved type concealed three point locking device, operated from the inside of car by means of a special shape removable key and from the outside of car by means of a non-removable type handle. Locking device shall have a special adaptor which will enable the lock tongue to engage a lock strike attached to the elevator car shell wall.

d. All ceiling emergency exits shall receive an approved type thumb screw locking hardware arrangement operating from inside and outside of the elevator car.

e. All emergency exit locking devices and hardware shall be furnished and installed by the Contractor complete with all accessory items required for a complete installation.

f. All ceiling and side exit emergency exit doors will be equipped by others with electrical contacts that will prevent the operation of the car when the exit door of a car is open. Electric contacts shall be furnished and installed under Contract No. WTC-320.00. The Contractor shall provide all notches, cut-outs and reinforcing required to receive the electrical contacts to be furnished and installed under Contract WTC-320.00.

5. Fluorescent Lamps - Fluorescent Lamps shall be installed in the canopy recesses as shown. Ballast boxes shall be mounted on top of canopies.

a. Fluorescent lamps shall be rapid start warm white type. Regardless of the number of tubes shown on the Contract Drawings, the Contractor shall provide a sufficient number of lamps complete with ballasts and other required items to provide 20 foot candles maintained at a level 3'-0" above the cab floor without bright or shadow spots. There shall be at least two (2) separate circuits.

6. Ventilation - Ventilation for each elevator car shall be provided by means of an exhaust system complete with three (3) speed exhaust blowers mounted on heavy duty neoprene isolator pad assemblies of an approved design. Exhaust blowers shall operate quietly without vibration and in such a manner so as not to exceed decibel rating of 55 db. Blowers shall be of suitable capacity and shall properly exhaust the air within the elevator car enclosure regardless of the car size and capacity.

a. Blower shall be mounted above the canopy of each car as shown and noted on the Contract Drawings in the manner as hereinbefore specified, and shall be controlled by means of a four (4) station switch located in the locked portion of the car station.

136. ELEVATOR CAR ENCLOSURE CONSTRUCTION (Continued)

b. All exhaust openings shall be concealed and located as shown and noted on the Contract Drawings.

* 137. LOCAL PASSENGER ELEVATORS

A. ELEVATOR CAR ENCLOSURE DOORS - Each elevator car enclosure entrance shall receive center opening, horizontal sliding doors of hollow metal solid panel, flush type construction. Doors shall be not less than one (1) inch thick and shall be of sizes required to suit openings as shown and noted on the Contract Drawings and as herein specified.

1. Doors shall be fabricated of No. 16 gauge furniture steel, complete with continuous rubber astragal bumpers on the meeting edges of all center opening doors, and at the limit of travel in the closed position of all side opening two-speed doors except where detecting devices are furnished. Internal vertical reinforcing members of No. 18 gauge sheet steel shall be spot welded in place at eight (8) inches on centers for full height of doors. Interior of each panel shall be completely filled with sound-deadening and heat retardant material such as mineral wool. Doors shall be suitably reinforced, in an approved manner, to receive all door hardware, closing and detecting devices, power operators and hangers to be furnished and installed under Contract No. WTC-320.00. Templates for this Work shall be furnished to the Contractor by the contractor for Contract No. WTC-320.00.

a. Doors shall be stainless steel clad on interior faces and all lead edges. Face receiving the cladding shall be smooth and free of irregularities or deviations from the "flat" that might tend to "photograph" through the cladding material. Cladding shall be accurately formed, cemented under pressure and fastened securely in place in an approved manner. Cladding shall be not less than No. 18 gauge. Adhesive shall be an approved long polymer thiokol epoxy type compound which shall be applied in strict conformance with the manufacturer's recommendations. Welds shall be ground off smooth.

b. Hatch side face of doors shall be finished with two coats of baked-on enamel of a single solid color as selected by the Engineer.

B. ENTRANCE COLUMNS - Entrance columns extending from floor of cab to underside of ceiling above (on each side of entrance) shall be fabricated of No. 14 gauge stainless steel, and shall be formed and flanged as shown. All fastenings shall be concealed. Entrance columns shall be formed of single sheets without vertical and horizontal jointing, and shall be properly stiffened and reinforced.

* See Addendum No. 3, April 1, 1968, attached hereto.

1. Entrance columns shall be complete with face plates for one main car station and one auxiliary car station as indicated on the Contract Drawings. Cut-outs shall be made in the entrance column panels to properly receive the face plates which shall be so fabricated as to finish flush with column face after being fitted in position.

   a. FACE PLATES exclusive of certificate frames, car identity and capacity plates, shall be delivered to the contractor for Contract No. WTC-320.00 when required by the CPM of said Contract. After drilling, punching, hardware application and assembly have been performed under Contract No. WTC-320.00, the plates shall be returned to the Contractor for finishing and fitting. All reinforcing for the face plates shall be furnished and installed by the Contractor. Transportation charges, both to and from the shop of the Contractor, shall be paid by the Contractor.

C. TRANSOMS - Transoms extending between elevator enclosure car entrance columns, from a point below tops of entrance doors up to the ceiling line shall be fabricated of No. 14 gauge stainless steel, formed and flanged as shown and noted on the Contract Drawings, without joints and in one piece. Transom panels shall be drilled, punched, slotted, and properly reinforced in such a manner as to properly receive all hardware, electrical equipment, and other accessory items as may be required to be furnished and installed into the construction to be performed under Contract No. WTC-320.00. All such construction shall be performed by the Contractor in accordance with shop drawings and templates which shall be furnished to the Contractor by the contractor for Contract No. WTC-320.00.

1. Lettering and numerals to be photo-engraved on the transom panels by the Contractor shall be of size and type as shown and noted on the Contract Drawings. Samples of all lettering and numerals shall be made available to the Contractor at the office of the Engineer.

2. Transom panels shall be hinged to allow for "In Car" floor position and progress indicators, read-outs where required and accessory items furnished and installed under Contract No. WTC-320.00. Hinges shall be concealed, continuous steel piano type. Clearances between transom panel and adjacent construction, including entrance columns, shall be not greater than 1/16 inch. Joints formed around perimeter of transom panel shall be so arranged as to totally eliminate all light seepage from the indicator equipment. Locking arrangement shall be approved type thumb screws with threaded holes located as shown and noted on the Contract Drawings.

D. BASE, FRIEZE AND TRIM - Base, frieze over wall panels, and trim exposed in vertical joints between wall panels, shall be fabricated of No. 16 gauge stainless steel. Base and frieze shall extend continuously along side and rear walls as shown. Base shall extend from floor to point up behind wall panels. Frieze shall extend from a point behind tops of panels up to ceiling above. Trim between panels shall extend from top of base up to frieze member in one continuous piece lapping backs of panels by not less than 3/4" on each side. Base, frieze and trim shall be attached to shell wall of cab with concealed fastenings of a type and by method approved by the Engineer.

E. SIDEWALLS - Each side wall shall receive removable wood paneling of type hereinbefore specified and of size as indicated on the Contract Drawings, in single lengths without horizontal joints.

1. Hardware, including continuous vertical mounting hat members (keyhole type with punched keyholes for slip-on mounting) shall be furnished and installed under this Contract. Such mounting hardware shall be of sufficient thickness and strength to properly support the panels in a rigid and secure manner without danger of pulling out from walls, slipping or allowing panels to move in any way. All panel fastenings shall be completely concealed. All panel mounting details shall be approved by the Engineer prior to the fabrication of any of the hardware.

2. Where the contractor for Contract WTC-320.00 is required by said contract to perform certain operations to the wood paneling furnished by the Contractor, the Contractor shall deliver said wood paneling to the contractor for Contract WTC-320.00. After drilling, cutting out, hardware application and assembly have been performed under Contract No. WTC-320.00, the panels shall be returned to the Contractor for finishing and fitting. All reinforcing shall be furnished and installed by the Contractor. Transportation charges, both to and from the shop of the Contractor, shall be paid by the Contractor.

F. CEILING EMERGENCY HATCH EXITS - Ceiling emergency hatch exits shall be complete with No. 12 gauge sheet metal covers, and all special provisions for exiting through the shell and suspended ceiling. Exit covers shall open upward and shall be so arranged and equipped that they may be opened from both the inside and the top of the car without need for tools. All required hinges, latches and operating handles shall be included under this Contract as shall all other items necessary for a complete installation.

137. LOCAL PASSENGER ELEVATORS (Continued)

G. SIDE EMERGENCY EXITS - Side emergency exits shall be complete with No. 14 gauge sheet metal exterior cover. The Contractor shall make all special provisions necessary for exiting through the shell. Side exits shall be arranged to pivot inward in such manner that end of door will swing in allowing the door to swing to flat against rear wall paneling.

1. The car interior side of side emergency exits shall receive wood veneered paneling as hereinbefore specified. Exit door shall be fabricated in same manner as typical shell wall. All required hinges, latches and operating handles, hardware and locks shall be included under this Contract as shall all other items necessary for a complete installation.

H. FINISHED CEILINGS - Finished luminous ceiling shall consist of metal mesh panels as hereinbefore specified with an overlay of acrylic, translucent white plastic sheeting. Ceiling shall be constructed for easy and quick removal for access to light well above.

1. Metal mesh shall be in single piece or in panels as shown and noted on the Contract Drawings. Where hangers may be indicated or required they shall be furnished and installed under this Contract, but where hangers are installed they shall be so located and arranged as to cast no shadows through the ceiling construction.

a. Metal mesh shall be complete with a 1/4" x 3/4" high stainless steel metal retainer or edging strip around the complete perimeter of a metal mesh panel. Retainer (edging) strip shall act as a perimeter stop for the plastic sheeting which shall be centered over the ceiling area as shown and noted on the Contract Drawings. Retainer (edging) strip shall be secured to the metal mesh panel in an approved manner.

b. Finished ceiling shall be without sag, and shall lay perfectly flat. Plastic ceiling overlay shall be secured in place with approved type removable clips or wing nut fasteners.

138. SHUTTLE ELEVATORS AND SHUTTLE COMBINATION ELEVATORS (C.E.)

A. ELEVATOR CAR ENCLOSURE DOORS - Each elevator car enclosure entrance, two per elevator car, shall receive two speed, center opening, horizontal sliding doors of hollow metal, solid panel, flush construction. Doors shall be of not less than one (1) inch thick and shall be of sizes required to suit openings as shown and noted on the Contract Drawings.

138. SHUTTLE ELEVATORS AND SHUTTLE COMBINATION ELEVATORS (C.E.) (Continued)

1. All doors shall be fabricated as hereinbebore specified for Local Passenger Elevator Car enclosure doors in Clause 137 (Par. A-1, and including sub-paragraph 1-a and 1-b).

B. ENTRANCE COLUMNS - Entrance columns shall be fabricated and installed as hereinbefore specified for Local Passenger Elevator Car entrance columns in Clause 137 (Par. B, B-1, and sub-paragraph 1-a).

C. TRANSOMS - Transom panels shall be fabricated and installed as hereinbefore specified for Local Passenger Elevator Car transoms in Clause 137 (Par. C and C-2).

D. BASE - Base shall be fabricated of 1/4 inch thick stainless steel angles and No. 16 gauge stainless steel sheeting. Angle and sheet metal base shall extend continuously under bottom ends of removable wood veneer wall paneling occurring on long sides of cab as shown and noted on the Contract Drawings.

1. Angle member shall be placed in position as shown on the Contract Drawings. Sheet portion of base shall extend from floor up to underside of outstanding angle leg to which it shall be securely fastened by means of an approved, continuous spring steel snap-in type arrangement.

a. Complete base assembly, including the top angle and the sheet base shall be attached to shell wall with concealed fastenings of a type, and by method, approved by the Engineer. Where base occurs at perimeter of shell wall, shell wall shall be reinforced by the addition of a 3" wide by No. 14 gauge continuous welded-on steel plate as shown and noted on the Contract Drawings.

b. Complete base assembly shall be fabricated in single continuous lengths without joints, except as shown, and shall terminate against vertical 1/4" thick stainless steel angle trim.

E. TRIM - Trim angles and "Tees" framing the vertical ends of removable wood paneling of each long side of the elevator car enclosure shall be fabricated of 1/4 inch thick, of one pice, machined or extruded stainless steel, of sizes and profiles as shown and noted on the Contract Drawings.

1. "Tees" shall be placed vertically between wood panels, and angle members shall be placed at vertical ends. "Tees" and angles shall extend from stainless steel angle forming top of base up to stainless steel perimeter trim at ceiling line, and shall be securely fastened to cab shell in an approved manner. Joints formed between vertical members and ceiling trim shall be hairline.

F. SIDEWALLS - Each long elevator car enclosure sidewall shall receive removable wood veneered paneling of type as hereinbefore specified and of size as shown and noted on the Contract Drawings, in single lengths without horizontal joints. Paneling shall be complete with mounting hardware as hereinbefore specified for Local Passenger Elevator Car sidewalls in Clause 137 (Par. E-1).

1. Each panel shall be blocked out from face of elevator car enclosure shell as shown and noted on the Contract Drawings. Blocking at bottom of each panel shall receive a 1/8" thick by 1" wide sponge neoprene strip which shall be securely cemented in place along bottom edge of blocking to act as a cushion between the blocking and the shelf angle construction shown, all of which shall be included under this Contract.

   a. Support clip angles shall be of size and thickness as shown on the Contract Drawings, with the length of clip not less than three (3) inches. Support cleats shall be continuous. Cushioning shall be of length of that specified for support clips and shall be so positioned to rest on support clips.

2. Where wood paneling shall receive work to be furnished and installed under Contract No. WTC-320.00, the procedural responsibilities of the Contractor shall be as hereinbefore specified for Local Passenger Elevator Car sidewalls in Clause 137 (Par. E-2).

G. CEILING EMERGENCY HATCH EXITS - Ceiling emergency hatch exits shall be fabricated complete with all necessary hardware and provisions for exiting through the shell, coffers and suspended ceiling as hereinbefore specified for Local Passenger Elevator Car ceiling emergency hatch exits in Clause 137 (Par. F).

H. SIDE EMERGENCY EXITS - Side emergency exits, located as shown and noted on the Contract Drawings, shall be fabricated complete with all stiffening, veneering and hardware as hereinbefore specified for Local Passenger Elevator Car side emergency exits in Clause 137 (Par. G and G-1).

I. CEILING TRIM - Ceiling trim extending around complete perimeter of elevator car enclosure and also forming a grid between ceiling coffers shall be fabricated of stainless steel bars. All edges of such bars shall be finished square and sharp as approved by the Engineer. Sizes of all members shall be as shown on the Contract Drawings.

1. Intersections of all ceiling trim members shall be welded, with all weld ground off smooth and finished to match the typical surface finish as hereinafter specified.

   a. Exposed bottom surfaces of all ceiling grid and peripheral trim members shall finish perfectly flush and all in the same plane.

J. SUSPENDED CEILING - Suspended luminous ceiling shall consist of metal mesh panels with an overlay of an acrylic, translucent white plastic sheeting as hereinbefore specified in Clause 137 (Par. H) and including lightwell ceiling coffers.

1. Woven metal mesh panels shall be complete with a 1/4" x 3/4" high stainless steel edge frame around the complete perimeter of a metal mesh panel. Corners of frame shall be mitred and welded with all welds ground smooth and finished to match typical surface finish as hereinafter specified. Metal mesh panels shall be secured to the stainless steel edge frame in an approved manner.

2. Woven wire mesh panels shall be suspended in the centers of ceiling coffers in such manner as to appear to float. Suspension members shall be such as to rigidly maintain the mesh panels in place without sway, vibration or bounce, while casting no shadows and being invisible from below the ceiling. In addition suspension members shall allow easy removal of the mesh panels for access to light well.

3. Ceiling coffers shall be formed of No. 16 gauge sheet metal, formed to indicated sizes and profiles, and securely bolted or welded in place.

a. Cut all exhaust air holes required in coffers where and as shown on the Contract Drawings.

b. All joints shall be welded. All welds shall be ground off smooth on exposed faces.

139. FREIGHT ELEVATORS

A. ELEVATOR CAR ENCLOSURE DOORS - Each Elevator car enclosure entrance for elevator Nos. 48, 99 and P-1 shall receive two-speed, side opening, horizontally sliding doors, and each elevator car enclosure entrance for elevator Nos. 49, 50, J-4, K-1 and K-2 shall receive center opening, horizontal sliding doors of hollow metal, solid panel, flush construction. Doors shall be not less than one (1) inch thick and shall be of sizes required to suit openings as shown and noted on the Contract Drawings.

1. All doors shall be fabricated and erected as hereinbefore specified for Local Passenger Elevator Car enclosure doors in Clause 137 (Par. A-1, and including sub-paragraphs 1-a and 1-b).

B. ENTRANCE COLUMNS - Entrance columns shall be fabricated and installed as hereinbefore specified for Local Passenger Elevator Car entrance columns in Clause 137 (Par. B, B-1, and Sub-par. 1-a).

C. TRANSOMS - Transom Panels shall be fabricated and installed as hereinbefore specified for Local Passenger Elevator Car transoms in Clause 137 (Par. C and C-2).

D. BASE - Base work shall be fabricated and installed to the extent, design and profile as shown and noted on the Contract Drawings and as specified for Local Passenger Elevator Car base in Clause 137 (Par. D).

E. SIDEWALLS AND CEILING - Each elevator car enclosure side wall, rear wall, and ceiling area shall receive removable type wood panel covering of type as hereinbefore specified, except that finished wood veneer facing shall be omitted and 1/8 inch thick "Tytron" laminate finish, or approved equal, shall be substituted in lieu thereof. Wood panels shall be of sizes as shown and noted on the Contract Drawings.

1. Each wall panel shall be in single lengths without horizontal joints and mounted to the elevator car sidewall as hereinbefore specified for Local Passenger Elevator Car sidewalls in Clause 137 (Par. E-1).

2. Ceiling panels shall be mounted to the elevator car enclosure canopy in a similar manner as hereinbefore specified for wall panels except that mounting hardware shall consist of hat type clips of depth and locations as shown and noted on the Contract Drawings. Mounting clips shall be sufficient in number and so located as to result in a perfectly level ceiling with all joints between panels flush and the entire installation in the same plane. Wood panels shall be of sizes shown.

   a. Ceiling panels shall be cut out to form exhaust air slots at the perimeter of the elevator car enclosure to the extent and locations as shown and noted on the Contract Drawings.

3. "Tytron" facing shall be laminated to face of wood panels in single lengths without horizontal and/or vertical joints in wall panels and with jointing of ceiling panels as shown and noted on the Contract Drawings. All "Tytron" facing shall be applied in strict conformance with the manufacturer's recommendations. Silicone jointing shall be performed as per manufacturer's specification.

4. Wall panels and ceiling panels at ceiling hatch shall receive 1/8" thick stainless steel edging extending continuously around all edges as shown. Edging shall be of same depth as over-all thickness of wall and ceiling paneling inclusive of "Tytron" facing, and shall finish perfectly flush with finished panel face. Intersections

shall be welded with all welds ground off smooth and finished to match the typical surface finish. Face and edge of such trim shall be exposed as shown.

5. Where wall paneling shall receive work to be furnished and installed under Contract No. WTC 320.00, the procedure and responsibilities of the Contractor shall be as hereinbefore specified for Local Passenger Elevator Car sidewalls in Clause 137 (Par. E-2).

6. As hereinbefore specified in the clause in the form of Contract entitled "Reduction of Prices" alternate "Fixed Sidewall Panels" shall be provided by the Contractor in lieu of "Removable Sidewall Panels" if so directed and approved by the Engineer.

   a. Fixed wall panels shall be mounted generally as hereinbefore specified for Local Passenger Elevators Cars except that all panels shall be permanently attached in place to the elevator car sidewall shell with concealed fasteners. Each wall panel shall be in single lengths without horizontal joints.

F. CEILING EMERGENCY HATCH EXITS - Ceiling emergency hatch exits shall be fabricated complete with all necessary hardware and provisions for exiting through the canopy shell and ceiling panels as hereinbefore specified for Local Passenger Car ceiling emergency hatch exits in Clause 137 (Par. F).

1. Ceiling emergency hatch exits for Freight Elevator Car Nos. 49 and 50 shall be oversized to size and extent as shown and noted on the Contract Drawings.

G. SIDE EMERGENCY EXITS - Side emergency exits shall be provided for Freight Elevator Car No. 48 only, located as shown and noted on the Contract Drawings and fabricated complete with all stiffening, Tytron facing and hardware as hereinbefore specified for Local Passenger Elevator Car side emergency exits in Clause 137 (Par. G and G-1).

H. HANDRAILS AND BUMPER RAILS - Handrails and bumper rails shall extend continuously around entire perimeter of elevator car enclosure to the extent of each freight elevator car as shown and noted on the Contract Drawings. Rails shall be furnished and installed complete with rails, rail channel brackets, sleeves and mounting bracket assemblies and screw fasteners. Rail mounting bracket assemblies shall extend through wood paneling as shown with rails mounted in such a manner as to allow easy removal. All exposed stainless steel screw fasteners shall be countersunk.

139. FREIGHT ELEVATORS (Continued)

1. Rail members and rail channel bracket arms shall be fabricated of stainless steel, machined or extruded to the size and profile as shown and noted on the Contract Drawings. Channel brackets shall be welded to rails with welds dressed smooth to receive finish as hereinafter specified. All rail member edges shall be rounded to a 1/16 inch radius.

2. Rail members shall be mounted to stainless steel mounting bracket arm and hat type assemblies at locations and heights from the top of elevator car enclosure floor level as shown and noted on the Contract Drawings. Mounting arm shall be welded to hat type mounting hardware. Hat type mounting hardware shall be bolted to the elevator car shell walls in an approved manner. Where mounting bracket arm pierces wall panel provide stainless steel tubular section sleeve for the full thickness of the panel to receive arm as shown and noted on the Contract Drawings.

3. Rails shall be continuous, single length, except where side emergency exits occur. Corners shall be mitered and closely fitted to hairline joints. At side emergency exits rail members shall be separate members of lengths as shown and noted on the Contract Drawings. One end shall be bent to return to face of door. All exposed rail ends shall be of the same finish as for rail face.

4. Rails shall terminate at the elevator car end walls as shown and noted on the Contract Drawings.

I. LIGHT TROUGHS - Light troughs extending around sides of elevator car enclosure as shown and noted on the Contract Drawings shall be fabricated of No. 14 gauge, formed stainless steel. Profiles shall be as shown and noted on the Contract Drawings. Intersections shall be mitered and welded with all weld ground off smooth and finished to match typical surface finish.

1. Light troughs shall be self-supporting and shall be installed without sag, waves, buckles, or other defects of appearance. The entire installation shall all be on the same plane.

140. CERTIFICATE, CAR IDENTITY AND CAR CAPACITY FRAMES

A. The Contractor shall furnish and install a stainless steel certificate frame, a car identity frame and a car capacity frame in each elevator car enclosure of design, type, profile and location as directed by the Engineer. All lettering shall be photo-engraved of style, type, size and extent as shall be determined by the Engineer. The Contractor shall submit samples to the Engineer for review and approval of all frames as hereinbefore specified for review and approval. Approved samples shall be incorporated into the Work.

141. ELEVATOR CAR ENCLOSURE PROTECTION PADS

A. The Contractor shall furnish complete elevator car enclosure protection pads for Shuttle Combination Elevator (C.E.) Car Nos. 5, 6 and 17, Freight Elevator Car Nos. 48, 49, 50 and 99, "Below Grade" Freight Elevator Car Nos. P-1, J-4, K-1 and K-2, "Below Grade" Passenger Elevator Nos. J-1, J-2, J-3, K-3, K-4 and K-5, and including twelve (12) sets for Local Passenger Elevator Cars of proper size to cover completely the four (4) sides of elevator car enclosures, excluding doors. All cut-outs for car operating panels shall be provided. Protection pads shall be similar to "Dandux" as manufactured by the C.R. Daniels Co. Incorporated, Bronx, New York or approved equal. The Contractor shall submit samples to the Engineer for review and approval.

1. Materials shall be fire-resistant 20 ounces per square yard canvas duck wing, quilted, olive drab in color. Padding shall be one (1) inch thick, 9 ounces per square yard, before sewing and shall be cross stitched with no lighter than #24 cord thread. Sewing shall be square in pattern with a maximum of six (6) inch squares. Padding shall be such that it will not settle or become bunched in the lower half of the square after constant use.

2. Brass grommets, No. 5 eyelets, shall be placed in a webbing strap at the top of the pads to match pad hooks. Grommets shall be placed so that the pads will be easily attached to the elevator car walls. Pads shall be furnished complete with rubber covered concealed type steel hooks.

142. FINISHES

A. SHEET METAL SURFACES - Surfaces of sheet metal remaining exposed on interior side of all cars (other than stainless steel) including light wells, canopies and in light coves shall receive a five (5) coat baked-on white enamel finish, color as selected by the Engineer. Inside (topside) of stainless steel light troughs shall be included.

1. All metal work shall be thoroughly cleansed of all oil, grease, rust and other foreign substances in preparation for finishing.

2. Metal shall be filled flush and smooth and given two (2) coats of primer and, three (3) coats of finishing enamel, each coat being baked on and sanded to a perfectly smooth surface. Final coat shall be rubbed to an eggshell gloss.

3. Cleaning of the sheet metal, application of fillers and prime coats, painting and baking shall be performed in strict accordance with the metal manufacturer's recommendations

142. FINISHES (Continued)

for a first class job. Finishing shall be a continuous process. Each coat of paint shall be of uniform thickness. Primer coats shall be applied using paints especially formulated for sheet metal.

B. STAINLESS STEEL - All exposed stainless steel surfaces shall receive an A.I.S.I. No. 4 or No. 7 finish respectively in all locations where called for on the Contract Drawings. Generally, all broad stainless steel surfaces shall receive the No. 4 finish and all narrow surfaces the No. 7 except as otherwise indicated. Finishes shall be vertically polished except for bars, background strips, base and stainless steel light troughs in freight cars.

1. Finishes shall match the samples in the office of the Engineer. All finishes shall be subject to his review and approval.

2. Except where otherwise specified, all concealed stainless steel light trough surfaces shall receive a five (5) coat baked-on white enamel finish, color as selected by the Engineer. All stainless steel surfaces shall be properly prepared to receive finish painting.

3. Wherever the Specifications require a No. 7 finish for stainless steel for hoistway entrance doors, transoms and panels, the No. 7 finish shall be modified by buffing to produce a bright "mirror-like" finish similar to the sample in the office of the Engineer. Where approved by the Engineer, the Contractor may substitute a No. 8 finish for these surfaces in lieu of the modified No. 7 finish.

C. WOOD VENEERS - All exposed wood veneered panel facing shall receive a factory applied protective coating of SHER-WOOD 900 CONVERSION VINYL SUPER KENVAR "C", as manufactured by Sherwin-Williams Company or approved equal. Surface preparation and application of fillers, base and finished coats shall be performed in strict accordance with the manufacturer's recommendations.

1. Wall paneling not requiring a balance sheet on concealed face shall receive an applied sealer for protection against the entrance of moisture. Balance sheeting or sealer coating shall be applied in strict conformance with the panel manufacturer's recommendations and shall be of a type made especially for such use by such manufacturer. If the contractor elects to utilize an applied sealer for protection against the entrance of moisture in lieu of furnishing a balance sheet, it shall not release him of

the responsibility of providing panels which will not warp or otherwise become distorted because of improper backing.

D. TYTRON - All "Tytron" wall and ceiling covering shall be furnished ready for installation, and complete with pre-applied adhesive.

1. All material required to be furnished to the elevator contractor for application on floors of cabs shall be complete with feature filler strip material.

2. Plywood panels receiving "Tytron" covering shall be well-sanded, cleaned, and all cracks (if any) filled in and made smooth. Back-up wood panels shall be primed as instructed by the wall covering manufacturer.

3. Wall and ceiling covering shall be applied with adhesive preapplied. Temperature at time of installation shall be not less than 60 degrees F. Care shall be taken to insure against the removal of release paper covering preapplied adhesive. Such paper shall only be removed when the piece of material is about to be applied to wall and/or ceiling surfaces. Back-up panels shall be entirely dust-free at time of application of wall and ceiling covering. Manufacturer's printed instructions shall be closely followed during all steps of application.

4. Ceiling paneling shall be applied with 1/8 inch wide joints and shall be filled in with silicone compound. Compound shall be applied and tooled to a slight concave joint in strict accordance with the manufacturer's instruction.

143. WORKMANSHIP

A. GENERAL

* 1. All elevator car enclosure construction shall be of the design shown on the Contract Drawings and Specifications in their present form, except that the heights of all Shuttle Elevator and Combination Elevator enclosures shall be increased by 1'-5". Methods of assembly and construction shall be the responsibility of the Contractor.

2. Each elevator car enclosure shall be constructed in such a manner that they will accommodate all accessory equipment furnished or furnished and installed under Contract No. WTC-320.00 entitled "The World Trade Center - Elevators and Escalators".

3. All joints, corners, miters and other joinery shall be accurately machined, filed and fitted, and rigidly connected at joints and contact points. All construction shall be carefully matched to produce a perfect continuity of line and design. All metal in contact shall have hairline joints, unless otherwise shown or specified.

4. All fastenings shall be concealed where practicable. Fiber shims shall be provided where necessary to prevent dimpling of face metal.

B. METAL WORK

1. All metal panels, trim, cladding and other exposed items in the finished Work shall be free of buckle, warping and oil canning effects. Flatness of panels shall not deviate more than 1/32" plus or minus.

2. All joints shall be carefully machined and fitted tight. Welds on exposed surfaces shall be dressed smooth and shall be of same color and finish of the member.

3. Reinforcing shall be provided at corners and intersections and for hardware items including operating mechanisms. Concealed reinforcing or framing members and concealed steel shapes shall be provided as may be required to maintain stability.

4. All shapes shall be accurately formed to required profiles.

5. Blemished surfaces of stainless steel will not be acceptable. All fastenings shall be concealed.

* See Addendum No. 3, April 1, 1968, attached hereto.

143. WORKMANSHIP (Continued)

C. WOODWORK

1. All finished wood paneling shall be of the highest grade cabinet work and shall be executed by skilled mechanics only, in the best and most workmanlike manner. The quality standards of the Architectural Woodwork Industry shall apply and by reference shall be made part of these specifications.

2. All the several parts of the wood panels shall be neatly and accurately fitted. All work shall be level, plumb, square and true. All work shall be thoroughly and securely fastened in place in an approved manner.

3. All fastenings shall be concealed.

4. All matched panels within a car enclosure shall be of same sequence as hereinbefore specified in Materials, Clause 135 (Par. A-5; sub-par. b).

D. PROTECTION OF THE WORK

1. Stainless Steel shall be protected during fabrication, transportation and erection against damage from mechanical abuse, paint, plaster, salts, acids, staining from accidental contact with or drip from rusted carbon steel or other dirt by a plastic or lacquer coating as recommended by the manufacturer. The coating shall be of a plastic type and of such composition that it may be easily removed with a solvent recommended by the manufacturer without harming the stainless steel finishes. The Contractor shall maintain the protection with particular attention given to finishes which, once damaged, cannot be restored in the field. After grinding and polishing or where severe forming is necessary, the surfaces shall be "passivated" by a nitric acid treatment as recommended by the mill.

E. MATERIALS

Materials to be furnished under this Contract shall be delivered to the job site and to the areas of installation, as directed by the Engineer, fully crated in approved type containers. Crates shall be without openings with each piece within the crate held firmly in place with wood cleats or wedges, well padded and separated by waxed building paper. Crates shall be so constructed as to withstand any damage that could be incurred during all packing, shipping, transportation and hoisting operations. All crates and items packaged within each container shall be properly identified and labeled by the Contractor.

143. WORKMANSHIP (Continued)

1. All crates or containers shall be unpacked at the area of installation by Others.

2. Materials returned to the Contractor by the contractor for Contract WTC-320.00 shall be examined by him at the time they are returned to him and if there is any shortage, damage or other defect, the Contractor shall at that time bring it specifically in writing to the attention of the Engineer. Any shortage, damage or defect so brought to the Engineer's attention and acknowledged by him will be corrected by the contractor for Contract WTC-320.00. If no shortage, damage or other defect is so brought to the attention of and acknowledged by the Engineer at the time said materials are furnished to the Contractor, the materials shall thereafter conclusively be deemed to have been satisfactory in all respects, provided that if the Contractor demonstrates to the satisfaction of the Engineer that there was a shortage, damage or defect at the time the materials were furnished to the Contractor and that such fact could not reasonably have been ascertained at that time, then the shortage, damage or defect will be corrected by the Authority.

CHAPTER V
ELEVATOR HOISTWAY ENTRANCES

144. MATERIALS

A. Materials used in the Work shall meet the following requirements:

1. Steel for plates, angles, channels and other structural steel shapes furnished under this Contract shall conform to the current edition of A.S.T.M., Specification A-7 or A-36, except where otherwise specified hereinafter.

2. Sheet Metal for doors and frames shall be full cold rolled, stretcher leveled, best quality open hearth furniture stock steel, full pickled, double annealed, bonderized, and free of rust, scale, pitting and other surface or internal defects.

3. Sheet Steel for sub-assembly items of the Work shall be carbon steel sheets conforming to the current edition of A.S.T.M. Specification A-245.

4. Stainless Steel shall be type No. 302 or 304, 18-8, non-magnetic, "Austenetic" stainless steel conforming to A.S.T.M. A-167.

5. Screws, Bolts, Anchors, and other fastenings shall be of approved types, suitable for the conditions encountered, and fabricated of metal similar to that being fastened, and of the same finish as the exposed material.

6. Heat Retarding Filler material shall be mineral fiber type conforming to Federal Specification HH-I-558a.

7. Nickel-Silver for elevator hoistway entrance sills as required, shall be 13 per cent No. 821 alloy as specified by the Anaconda American Brass Company.

8. Aluminum for elevator hoistway entrance sills as required, shall be equal to alloy No. 6061-T6 as manufactured by Alcoa.

9. Paint shall be as follows:

a. Paint for all structural and sub-assembly members shall conform to the current Federal Specification TT-P-86, Type II.

b. Paint for baked-on enamel finishes shall be an approved acrylic enamel which when applied shall meet or exceed the following:

(1) Humidity, 100 per cent at 100 degrees F for 1,000 hours with no film breakdown.

144. MATERIALS (Continued)

(2) Salt spray, 20 per cent at 100 degrees F for 300 hours with no color loss, etching, cracking or blistering.

(3) Water soak at 100 degrees F for 1,000 hours with no film breakdown.

(4) Hardness, shall withstand 500 gm load of a Hoffman Hardness Tester.

(5) Dry abrasion, shall withstand 600 cycles per mil of finish on a Gardner Abrasion and Washability Machine using abrasion boat and No. 220 sandpaper over a felt pad.

10. Sound Deadening Material shall be of the rubberized type, shall be resistant to fire, and shall be of either brush or spray consistancy.

11. Adhesive for use in applying stainless steel cladding shall be an approved long polymer thiokol epoxy type compound.

* 145. ELEVATOR HOISTWAY ENTRANCES

A. The following general requirements shall be required for all Elevator Hoistway Entrances.

1. All parts and appurtenances of the elevator hoistway entrances shall conform in every way to the requirements of the Safety Code for Elevators as approved by the American Standards Associates (A 17-1-1965) including all revisions to date hereinafter referred to as ASA A 17-1, the Proposed Elevator Code of the Department of Buildings of New York City which is attached hereto, and to all other codes and provisions which relate to the installation if the Authority were a private corporation. Where the Contractor finds conflicts between cited codes and the provisions of the elevator code of the Department of Buildings of New York City the provisions of the latter shall govern.

a. The Contractor shall bring to the attention of the Engineer conflicts between cited codes and the Specifications. The Engineer shall determine which provisions shall govern.

2. All metal gauges shown on the Contract Drawings and specified herein are U. S. Standard gauges. Where no gauges or thicknesses are shown for sheet metal or specified, stainless steel shall be a minimum of No. 16 gauge and sheet steel shall be a minimum of No. 16 gauge.

3. All elevator hoistway entrance doors and frames and including transom and fixed sidewall elevator hoistway enclosure panels, shall be of the heights and widths indicated on the Contract Drawings, and shall be of 1 1/2 hour fire rated construction conforming to the requirements of the Board of Standards and Appeals of the City of New York and bearing the required labels.

* See Addendum No. 3, April 1, 1968, attached hereto.

145. ELEVATOR HOISTWAY ENTRANCES (Continued)

4. All elevator hoistway entrances shall be complete with doors, door guides and bumpers, door frames, door sub-frames (where required), sills (saddles) headers, coverplates, struts, fascias, toeguards, dust plates, sight guards and all other items required for a complete installation whether or not indicated or specified.

5. Except as otherwise shown, specified, or directed by the Engineer, the method of assembly and joining shall be at the Contractor's option, provided the results are satisfactory to the Engineer. The Contractor's methods, such as will produce the required results of workmanship shall be subject to the Engineer's approval.

6. All exposed surfaces shall be shaped as shown. Door edges, unless otherwise shown, shall be square and shall be shaped properly to permit operation of the hardware. Door and transom surfaces shall be perfectly flat as determined by a straight edge applied on the face in any direction. All exposed surfaces and finishes shall be free from buckles, pits, dents, and defects of any nature.

7. Shop assembled connections shall be welded. Field connections shall be bolted, welded, or shall be screwed as required. All connections shall be made in accordance with best standard practice. Joints shall be designed to be strong and rigid. All work shall be designed and fabricated to support any loads which may normally be imposed. The sizes and thicknesses of all items shown or specified are minimum sizes and shall be increased as required to meet the design loading and encountered conditions.

8. Welding, except where tack or other type welding is required by the Contract Drawings, shall be continuous along the entire line of contact. Welds on exposed finished surfaces shall be ground smooth and shall be finished flush with adjacent surfaces. Welding shall conform to the applicable requirements of the American Welding Society "Standard Code for Arc and Gas Welding in Building Construction".

   a. Welding of stainless steel, where practicable, shall be made from the back or unexposed face of the stainless steel to avoid discoloration or other damaging effects to appearance.

9. All necessary rabbets, lugs, shims and brackets shall be provided so that the work can be assembled and installed in a neat, substantial manner. Fastenings shall be concealed on exposed surfaces, except as otherwise permitted by the Engineer. Thicknesses of metal, and details of assembly and support shall provide ample strength and stiffness, and where not indicated or specified otherwise, shall be as required by the Engineer. Built-up parts shall have all horizontal lines level and all vertical lines plumb, unless otherwise indicated on the drawings.

10. All joints, seams and intersections of ornamental covering work and of sheet metal work shall be welded in an approved manner, and shall be ground smooth and finished flush with adjacent surfaces so as to provide invisible joints, seams, and intersections on face side. All welding

145. ELEVATOR HOISTWAY ENTRANCES (Continued)

work shall be completed prior to applying the required finishes.

11. STAINLESS STEEL CLAD DOORS and stainless steel door frames shall be furnished and installed at the following elevator hoistway entrances:

    a. All those occurring at the 1st floor Concourse Level Lobby areas of Tower "A" and Tower "B" buildings respectively, with the exception of the elevator hoistway entrances to Freight Elevator No. 49 for both Towers "A" & "B".

    b. All those occuring at the Main Corridors and at the Local Passenger Elevator Lobbies on the 44th and 78th floor "Skylobby" Levels of Tower "A" and Tower "B" respectively.

    c. Concourse Level (1st Floor) elevator hoistway entrances for "Below Grade" elevator Nos. J-1, J-2, J-3 and "P-1" respectively.

12. SHEET METAL DOORS and steel door frames shall be furnished and installed at the following elevator hoistway entrances of Tower "A" and Tower "B" respectively unless herein otherwise specified or noted as "Below Grade" installations.

    a. Elevator No. 5: Service Level, 2nd through 5th floors inclusive, 7th floor, and 9th through 40th floors inclusive.

    b. Elevator No. 6: Service Level, 3rd through 5th floors inclusive, 75th floor, and 77th through 107th floors inclusive (and including the 2nd floor Plaza Level elevator hoistway entrance for Tower "B" only).

    c. Elevator No. 7: Service Level, 67th floor and 107th floor (and including the 2nd floor Plaza Level elevator hoistway entrance for Tower "B" only).

    d. Elevator Nos. 16, 18 and 19: 44th floor.

    e. Elevator No. 17: Service Level, 1st floor Concourse Level, (one entrance only), 3rd, 4th and 5th floors, 41st floor, and 43rd through 74th floors inclusive.

    f. Elevator Nos. 24 and 29 (Tower "A" only): Service Level, and 9th through 16th floors inclusive.

    g. Elevator Nos. 25, 26, 27 and 28 (Tower "A" only): 9th through 16th floors inclusive.

    h. Elevator Nos. 26 and 27 (Tower "B" only): Service Level and 9th through 16 floors inclusive.

145. ELEVATOR HOISTWAY ENTRANCES (Cont'd)

i. Elevator Nos 24, 25, 28 and 29
(Tower "B" only): 9th through 16th Floors Inclusive.

j. Elevator Nos. 30 and 35
(Tower "A" only): Service Level, and 17th through 24th Floors inclusive.

k. Elevator Nos. 31, 32, 33 and 34
(Tower "A" only): 17th through 24th Floors inclusive.

l. Elevator Nos. 32 and 33
(Tower "B" only): Service Level, and 17th through 24th Floors inclusive.

m. Elevator Nos. 30, 31, 34 and 35
(Tower "B" only): 17th through 24th Floors inclusive.

n. Elevator Nos. 36 and 41
(Tower "A" only): Service Level, and 24th through 32nd Floors inclusive.

o. Elevator Nos. 37, 38, 39 and 40
(Tower "A" only): 24th through 32nd Floors inclusive.

p. Elevator Nos. 36 and 41
(Tower "B" only): Service Level, and 25th through 32nd Floors inclusive.

q. Elevator Nos. 37, 38, 39 and 40
(Tower "B" only): 25th through 32nd Floors inclusive.

r. Elevator Nos. 42 and 47:
Service Level, and 32nd through 40th floors inclusive (with the exception of omitting the elevator hoistway entrances at the 32nd Floor for both Elevator Nos. 42 and 47 for Tower "B" only).

s. Elevator Nos. 43, 44, 45 and 46:
32nd through 40th Floors inclusive (with the exception of omitting the elevator hoistway entrances at the 32nd Floor for Elevator Nos. 43, 44, 45 and 46 for Tower "B" only).

t. Elevator No. 48:
Service Level, 2nd through 7th Floors inclusive, and 9th through 40th Floors inclusive.

u. Elevator No. 49:
Service Level, 1st Floor Concourse Level, 3rd, 4th and 5th Floors and 41st through 74th Floors inclusive.

v. Elevator No. 50:
Sub-Level Nos. 5, 3, 2 and 1, Service Level, 2nd through 7th Floors inclusive, 9th through 43rd floors inclusive, and 45th through 108th Floors inclusive (with the exception of omitting the Elevator Hoistway Entrance at Sub-Level No. 5 for Elevator No. 50 for Tower "B" only).

145. ELEVATOR HOISTWAY ENTRANCES (Cont'd)

w. Elevator Nos. 51 and 52:
45th through 54th Floors inclusive.

x. Elevator Nos. 53, 54, 55 and 56:
46th through 54th Floors inclusive.

y. Elevator Nos. 57, 58, 59, 60, 61 and 62:
55th through 61st Floors inclusive.

z. Elevator Nos. 63, 64, 65 and 68:
61st through 67th Floors inclusive (with the exception of omitting Elevator Hoistway Entrances at the 61st floor for Elevator Nos. 63, 64, 65 and 68 for Tower "B" only).

aa. Elevator Nos. 66 and 67:
43rd, and 61st through 67th Floors inclusive (with the exception of omitting the elevator hoistway entrances at the 61st Floor for Elevator Nos. 66 and 67 for Tower "B" only).

bb. Elevator Nos. 69, 70, 71, 72, 73 and 74:
61st, and 67th through 74th Floors inclusive (with the exception of omitting elevator hoistway entrances at the 61st and 67th Floors for Elevator Nos. 69, 70, 71, 72, 73 and 74 for Tower "B" only).

cc. Elevator Nos. 75, 76, 77 and 80:
80th through 86th Floors inclusive.

dd. Elevator Nos. 78 and 79:
77, and 79th through 86th Floors inclusive.

ee. Elevator Nos. 81, 82, 83, 84, 85 and 86:
87th through 93rd Floors inclusive.

ff. Elevator Nos. 87, 88, 89, 90 91 and 92:
94th through 100th Floors inclusive.

gg. Elevator Nos. 93, 94, 95, 96, 97 and 98:
101st through 107th Floors inclusive.

hh. Elevator No. 99:
106th through 110th Floors inclusive.

ii. "Below Grade" Elevator Nos. J-1, J-2 and J-3:
Sub Level Nos. 5, 4, 3, 2 and 1, and Service Level.

jj. "Below Grade" Elevator No. J-4:
Service Level and 1st Floor Concourse Level.

kk. "Below Grade" Elevator No. K-1:
Service Level and 1st Floor Concourse Level.

ll. "Below Grade" Elevator No. K-2:
Sub Level No. 5, Elevation 257', Elevation 268' and Service Level.

145. ELEVATOR HOISTWAY ENTRANCES (Continued)

mm. "Below Grade Elevator Nos. K-3, K-4 and K-5: Sub-Level Nos. 5, 4, 3, 2 and 1, Service Level and 1st Floor Concourse Level.

nn. "Below Grade" Elevator No. P-1: PATH Platform (Elevation 250'), Sub-Level Nos. 3 and 1, and Service Level.

13. POWER OPERATED TYPES For Elevator Hoistway Entrance Doors shall be:

a. Center Opening, Horizontal Slide: For both Towers "A" and "B" unless otherwise specified as "Below Grade" Installations.
   (1) All Local Passenger Elevators-Elevator Nos. 24 through 47 inclusive and Elevator Nos. 51 through 98 inclusive.
   (2) Freight Elevators-Elevator Nos. 49 and 50.
   (3) "Below Grade" Passenger Elevators-Elevator Nos. J-1, J-2, J-3, K-3, K-4 and K-5.
   (4) "Below Grade" Freight Elevators-Elevator Nos. J-4, K-1, and K-2.

b. Two-Speed, Center Opening, Horizontal Slide: For both Towers "A" and "B".
   (1) Shuttle Elevators-Elevator Nos. 1 through 4 inclusive, 7 through 16 inclusive, and 18 through 23 inclusive.
   (2) Shuttle Combination Elevators (C.E.)-Elevator Nos. 5, 6 and 17.

c. Two-Speed, Side Opening, Horizontal Slide: For both Towers "A" and "B" unless otherwise specified as "Below Grade" installations.
   (1) Freight Elevators - Elevator Nos. 48 and 99.
   (2) "Below Grade" Passenger Elevator - Elevator No. P-1.

14. ELEVATOR ENTRANCE DOOR FRAMES shall be cut-out, punched and properly reinforced, where required, in such a manner as to properly receive signal buttons and other items of Work as may be required to be furnished and installed into the Work under Contract No. WTC-320.00. All such Work shall be performed by the Contractor in accordance with shop drawings and templates which shall be furnished to the Contractor by the Contractor for Contract No. WTC-320.00.

15. ELEVATOR HOISTWAY ENTRANCE DOORS and related work shall be constructed and installed in such a manner as to properly receive the Work as may be required to be furnished and installed into the Work under Contract No. WTC-320.00, including all door operations, hangers and interlocks, and other accessory items.

* 146. SUB-ASSEMBLIES

A. The following sub-assembly work shall be furnished and installed complete by the Contractor, unless otherwise specified or noted.
   1. HEADER PLATES - The header plates shall be formed of 3/16 inch thick bent steel plate, which shall extend continuously, in one piece, between vertical struts and operator support frame, where they shall be bolted in place.

* See Addendum No. 3, April 1, 1968, attached hereto.

146. SUB-ASSEMBLIES (Continued)

a. Where necessary to properly receive masonry wall construction, a sub-frame at head and jambs shall be provided as indicated on the Contract Drawings of sufficient thickness to support the masonry above as hereinafter specified.

b. At "Skylobby" floor where hanger-cover plate extends down below tops of Elevator Hoistway entrance door and becomes exposed as entrance doors move to open position, the fascia members shall be fabricated of the same metal as the hoistway entrance doors and frames; stainless steel or sheet metal as the condition dictates.

(1) All such hanger-cover plate members shall be made easily removable and shall be finished with No. 7 stainless steel finish and with baked-on enamel respectively as the condition requires. Metal shall be of the thickness specified for typical fascia members.

2. DUST PLATES - Dust Plates shall be fabricated of No. 14 Gauge Sheet steel and shall be provided at the topmost landing of each elevator, shall be of beveled contour and fastened to the header and to the wall or structural framing member in an approved manner.

3. HANGERS - Hangers shall be furnished and delivered to this Contractor at the proper locations as directed by the Engineer by the contractor for "Elevator and Escalators" under Contract No. WTC-320.00. Installation of this work shall be the responsibility of the Contractor. Transportation charges from the shop shall be paid by the contractor under Contract No. WTC-320.00.

4. HANGER COVER PLATES - The Hanger Cover Plates shall be removable type fabricated of No. 14 Gauge steel and shall extend for the full travel of the doors. The Cover Plates shall be made in sections for convenient access for servicing the hangers.

5. STRUT AND CLOSURE ANGLES - Angles supporting the hoistway entrances shall extend from the sill to the bottom of the beams, slab or other construction above. One such support angle shall be located on each side of all entrances. The strut angles shall be a minimum of 3" x 3" x ½" structural steel, and where necessary to properly support the entrances shall be heavied up to sizes necessary for the conditions encountered.

6. TOE GUARDS - Beveled toe guards shall be fabricated of No. 14 gauge steel, and shall be furnished and installed at the lowest landing of each elevator and where required above dust cover at the topmost landing. Toe guards shall be not less than 6" wider than elevator hoistway entrance opening.

146. SUB-ASSEMBLIES (Continued)

7. FACIA PLATES - Facia Plates shall be fabricated of No. 14 gauge steel and shall be amply reinforced, in an approved manner, as required to maintain them free of buckles and waves. Facia plates shall extend from top of each header and hanger housing member up to the sill of the landing above and shall be securely fastened in place at both sill level and at header level. Fascia plates shall be not less than six (6) inches wider than the elevator entrance opening.
   a. At 1st floor Concourse Level, entrances located between columns Nos. 501 and 508, and 1001 and 1008 shall have fascia plates (closures) extend from header up to concrete beam haunch offset above as detailed in the Contract Drawings.

   b. Where Elevator hoistway enclosure walls are flush with the superstructure framing members at floor levels above and below elevator hoistway entrances, no facia plates shall be required.

* 147. HOISTWAY ENTRANCE DOOR FRAMES

A. HOISTWAY ENTRANCE DOOR FRAMES shall be furnished and installed complete under this Contract, and shall be of hollow metal, unit type, construction complete with welded joints at all intersections between head and jambs. Sub-frames shall be furnished and installed as required by the Contract Drawings for all 1st Floor Concourse Level elevator entrances occurring between columns Nos. 501 and 508, and 1001 and 1008. Where hoistway entrance door frames shall be stainless steel, frames shall be three piece knock-down unit type construction complete with approved type bolted head and jamb assembly.

1. SUB-FRAMES shall be of steel shapes as shown and noted on the Contract Drawings. Where no thickness is specified, sub-frames shall be fabricated from sheet steel of not less than No. 12 Gauge Thickness.

2. FRAME REINFORCING shall be of sizes indicated and shall be provided at the head and jambs, unless otherwise shown or noted on the Contract Drawings. Where not otherwise shown or specified, reinforcing shall be fabricated from sheet steel of not less than No. 12 Gauge Thickness.
   a. At Skylobbies, Concourse and Sub-Grade Floor Levels Elevator Entrance Frames shall be reinforced as shown and noted on the Contract Drawings and in such a manner as to safely receive and support the marble veneer and facing tile above. A minimum 3/16 inch reinforcing member shall be provided to insure the rigidity and stiffness of the jamb and head members of the elevator hoistway entrance frames. The type, thickness and extent of the reinforcing shall be as approved by the Engineer.

   b. All required reinforcement, both at the heads and at the jambs, shall extend continuously for full length of the member reinforced. All reinforcing shall be spot welded to the frame in an approved manner and shop applied.

*See Addendum No. 3, April 1, 1968, attached hereto.

147. HOISTWAY ENTRANCE DOOR FRAMES (Continued)

c. Where frames shall receive work to be furnished and installed under Contract No. WTC 320.00, the Contractor shall provide all punching, cut-outs and reinforcing as may be required to properly receive the work by others.

B. JAMBS AND HEADS for Elevator hoistway entrance frames at all floors, as hereinbefore specified, shall be fabricated to the sizes, profiles, and extent as shown and noted on the Contract Drawings. Joints shall be welded flush and even for hollow metal frames, and bolted tight and flush for stainless steel frames. All fastenings shall be invisible from the corridor side.

1. JAMBS as shown and noted on the Contract Drawings, shall completely enclose the surrounding walls for the full thickness of such wall and shall be returned on the hatch side to present a neat and finished appearance. At head, return shall be sufficient to overlap the header unless otherwise shown. Jambs shall be provided with ample clearance between sliding doors and the wall. They shall be securely fastened to the sills, and the head jambs shall be connected to the header by means of positive fasteners of such as to assure perfect alignment with hanger support. There shall be at least two (2) fasteners on each jamb between the jamb and the sill. Key holes or such type fasteners shall not be permitted.

2. HEAD Members of Elevator hoistway entrance door frames shall be fabricated in one (1) piece, without jointing, and properly reinforced to eliminate sag, buckling and waves. Where head sections shall receive work to be furnished and installed under Contract WTC 320.00 as herein specified in sub-paragraph A (2C) the head members of the Elevator Entrance Door Frames shall be drilled, punched, or slotted and properly reinforced in such a manner as to properly receive all progress indicators, hardware and other accessory items as may be required to be furnished and installed into the Work under Contract No. WTC 320.00. All such Work shall be performed by the Contractor in accordance with shop drawings and templates which shall be furnished to the Contractor by the Contractor for Contract No. WTC 320.00.

a. Where "Fire-Test" Panels are shown and noted on the Contract Drawings as an integral part of the head member of the Elevator Hoistway Entrance door frame, the panels shall be fabricated, reinforced, constructed, fire-rated and of same thickness as specified herein for elevator hoistway entrance doors. Panels shall be securely fastened in-place with approved type fasteners and shall extend for the full height and depth of the head section of the Elevator Hoistway Entrance Frame.

147. HOISTWAY ENTRANCE DOOR FRAMES (Continued)

3. HOLLOW METAL FRAMES shall be fabricated of No. 14 Gauge cold rolled steel as hereinbefore specified.

4. STAINLESS STEEL FRAMES shall be fabricated of No. 14 gauge stainless steel of type as hereinbefore specified. Stainless steel frames shall be without sheet metal back-up liner.

5. SOUND DEADENING - All elevator hoistway door frames, including all jamb and head sections, shall receive and application of sound deadening material of type as hereinbefore specified. Material shall be applied to the concealed side of the frame for the full depth, width, length and extent of the profiles of the members and shall be not less than 1/8 inch thickness by spray or brush.

* 148. HOISTWAY DOORS AND TRANSOMS

A. Each elevator hoistway entrance door shall receive horizontal sliding doors of types of operations as hereinbefore specified where shown and noted on the Contract Drawings. The Contractor shall also furnish and install complete all "stepped-in" transom panels over Elevator Hoistway Entrance Doors at Concourse Level for Shuttle Elevator openings only. Transom panels shall be constructed to follow the same vertical planes of the Elevator Entrance Door Leafs when doors are in a closed position. All Elevator Hoistway Doors and transom panels (where required) shall be of hollow metal, solid panel, flush type construction, and shall be of sizes and thicknesses as shown and noted on the Contract Drawings and as required to suit each and every opening. All doors and/or transoms to receive stainless steel cladding shall be furnished and installed as herebefore specified. Elevator Hoistway Entrance Doors shall be not less than 1¾ inch thick and transom panels shall be not less than 1 1/4 inch thick.

1. DOORS AND TRANSOM PANELS shall be fabricated of No. 16 gauge, cold rolled furniture stock steel face sheets welded together and finished by grinding and smoothing to produce a wrap-around surface that will withstand the rigors of use without separation. Lock seams will not be acceptable. Doors and transoms shall be reinforced with internal vertical reinforcing members of No. 18 gauge sheet steel, formed and spot welded in place on not more than eight (8) inches on centers for full height of doors and transoms. Interior of door and transom panels shall be completely filled with sound deadening and heat retardent material as hereinbefore specified. Such material shall be placed over entire area of door and transom panel in conformance with label requirements.

* See Addendum No. 3, April 1, 1968, attached hereto.

148. HOISTWAY DOORS AND TRANSOMS (Continued)

a. All face surfaces of doors and transom panels shall be perfectly flat as hereinbefore specified.
b. Doors shall be complete with all required continuous rubber astragal bumpers on the meeting edges and at the limit of travel in the opening direction.
c. Elevator hoistway entrance doors shall be of such size as to provide an overlap of not less than 3/4 inch at Jambs, heads and between overlapping leafs. On center opening doors, the clearance between meeting edges shall not exceed 1/8 inch when the doors are in a closed position.

2. STAINLESS STEEL CLADDING - All Elevator Hoistway Entrance Doors and Transom Panels requiring stainless steel cladding as hereinbefore specified shall be faced on the Exterior side of the Elevator Hoistway Entrance Enclosures, and including all door and transom edges with No. 16 Gauge Stainless Steel. Face and edges receiving cladding shall be smooth and free of irregularities or deviations from the "Flat" that might tend to "Photograph" through the cladding material.

a. Stainless Steel Cladding shall be accurately formed, cemented under pressure and securely fastened in place by welding or blind riveting. Adhesive shall be applied in strict conformance with the Manufacturer's Recommendations. All welds shall be ground off smooth and finished to match the finish of the panel face.

b. All stainless steel cladding shall be returned on itself at all lead edges, with return being turned under the face or edge covering as the case may be. All edges shall be covered for the full thickness of the door or transom panels.

c. Hatch side of stainless steel clad doors shall be finished with baked-on enamel of a single color as selected by the Engineer.

148. HOISTWAY DOORS AND TRANSOMS (Continued)

3. SIGHT GUARDS - Sight guards shall be furnished and installed complete along the edges of all elevator hoistway doors. Sight guards shall be 1/8 inch thick "Tenite" as manufactured by the Otis Elevator Company, New York, New York or approved equal.

   a. "Tenite" shall be Formula No. 203E, MH grade, cellulose acetate butyrate (Tenite II) non-conducting material of a non-metallic pigment, color as selected by the Engineer. Colors shall match the corridor side of hoistway elevator door panels as may be determined from samples submitted by the Contractor to the Engineer for review and approval. Surface finish shall be glossy and free of pimples, fish eyes and cell marks.

   b. Sight guards shall be installed in such a manner as to reduce to a minimum the clearance between the elevator hoistway entrance doors and elevator car doors and to conceal the hoistway and car beyond the hatchway opening when the hoistway doors are in an open position.

   c. Sight guards shall be continuous and in one (1) piece extending from top to bottom of doors.

   d. The Contractor shall furnish and install sight guards complete with approved transfer type plastic floor numerals designating the landing. Door numerals shall be attached with approved type fasteners. All elevator hoistway doors shall receive key-ways as required.

4. REMOVABLE GUIDES - All elevator hoistway doors shall be furnished and installed complete with approved type removable guides of design and material which will insure smooth, soundless operation. Guides shall be installed in the elevator hoistway sill grooves as approved by the Engineer.

148. HOISTWAY DOORS AND TRANSOMS (Continued)

5. All elevator hoistway doors and transom panels shall be properly reinforced, scribed and tapped in an approved manner to receive all attachments and hardware to be furnished and installed by the Contractor, and including hoistway door sheave type two point suspension hangers, power operators and guides to be furnished under Contract No. WTC-320.00. The contractor for Contract No. WTC-320.00 shall deliver to the locations of installation, as directed by the Engineer, all units to be installed into the Work by the Contractor. Transportation charges from the shop to the site shall be paid by the contractor for Contract No. WTC-320.00.

149. HOISTWAY ENCLOSURE FIXED WALL PANELS

A. The Contractor shall furnish and install complete all elevator hoistway enclosure fixed wall panels at Shuttle Elevator entrances located on the 1st floor Concourse Level along column lines 500 and 1000 from the top of the Concourse floor slab to the soffit of the structural steel framing member above, and from elevator hoistway door jambs to the face of "major" or "minor" columns as shown and noted on the Contract Drawings.

1. Panels shall be fabricated of single length, of width and thickness as shown and noted on the Contract Drawings. Dummy joints shall be provided where shown and noted on the Contract Drawings. Panels shall be constructed as hereinbefore specified for elevator hoistway doors complete with stainless steel cladding with the exception of the gauge of the internal, vertical reinforcing members which shall be No. 12 gauge in lieu of No. 18 gauge.

a. Panels shall be securely anchored in place with approved type steel clips, angle brackets, fasteners and anchors. Where angle brackets are fastened to structural steel members and to concrete, approved type bolted or welded connections to the steel and anchors to concrete respectively shall be provided. All fastenings shall be completely concealed along bottom, top and vertical edges adjacent to wall surfaces.

b. Panels shall be erected plumb and true, and in perfect alignment. All joints between abutting column or wall surfaces and connecting transom panels shall be hairline with a maximum allowable joint not more than 1/16 inch wide. All clips shall be adjustable. The final adjustment shall be as directed by the Engineer. Where wall treatments (construction by others) shall be installed after elevator entrance construction has been completed, abutting joints will be the responsibility of others.

149. HOISTWAY ENCLOSURE FIXED WALL PANELS

c. Stainless steel cladding shall return not less than one (1) inch along all lead panel edges. At the elevator hoistway entrance jambs, the stainless steel covering shall be provided along the full width of the panel edge and extended one (1) inch along the hatch side of the panel for the full height of the opening.

d. The Contractor shall provide all bolts, washers, and approved type metal shims for the complete installation of the Work.

150. HOISTWAY DOOR SILLS

A. The Contractor shall furnish and install all elevator hoistway door sills as shown and noted on the Contract Drawings. The Contractor shall examine the Contract Drawings, including all details for the exact location, layouts, profiles, grooves, dimensions and extent of all sill installations. Sill shall be continuous and in one piece through-out the full travel of the elevator hoistway entrance doors, and shall project not less than 1/4 inch beyond the finished face of doors (slow leaf of two-speed doors where required) on the exterior side.

1. All sills shall be fastened to and supported by steel brackets complete with all necessary approved type steel wedge type plate shims. Brackets shall be securely anchored in place and fastened to bent steel plate edge forms (furnished and installed by Others), or bent steel plate anchor straps (furnished and installed by Others), or other construction as shown and noted on the Contract Drawings. The spacing of the sill brackets and the thickness of the sills (minimum 3/4 inch) shall be as required to make the sills self-sustaining without other means of support being placed between the bracketing, both during construction and after the building has been completed. Sill bracket spacing shall not exceed eighteen (18) inches on centers within the door opening.

a. All fastenings of sill members to brackets and other points of anchorage shall be concealed.

2. Sills for all stainless steel elevator hoistway entrance doors shall be fabricated of "nickel-silver" as hereinbefore specified. Sills for all baked-on enamel (hollow metal) elevator hoistway entrance doors shall be fabricated of "aluminum" as hereinbefore specified. All sills shall be extruded.

a. All grouting of sills to be performed by others.

151. DUMMY ENTRANCES

A. "Dummy" Entrances as herein specified under "Scope of Work" and on the Contract Drawings shall be an exact duplication of the adjacent stainless steel Shuttle Elevator hoistway entrances. The fabrication, materials used, reinforcing and finishing shall be as hereinbefore specified for stainless steel Hoistway Entrance Door Frames, Hoistway Doors and Transoms and Hoistway Enclosure Fixed Wall Panels in Clauses 147, 148 and 149 respectively.

1. "Dummy" Entrances shall be complete with simulated sills, and all other items as shall be required to perfectly match the adjacent operating elevator hoistway entrances. All items required to be furnished and installed for the operating elevator hoistway entrances such as shaft side facias, door hangers and operators and the like shall not be included in this Work.

152. FINISHES

A. SHEET METAL SURFACES - All exposed surfaces of cold rolled, furniture stock steel elevator hoistway entrance doors and frames shall be finished as follows:

1. Baked-on enamel finish for all such entrances with the exception of those occuring at Sub-Level floors, Service Level, Mechanical Equipment Room Levels and at all other entrances opening within Service Lobbies or Utility spaces.

a. All metal work shall be thoroughly cleansed of all oil, grease, rust and other foreign substances in preparation for finishing.

b. Metal shall be filled flush and smooth and given two (2) coats of primer and three (3) coats of finishing enamel, each coat being baked on and sanded to a perfectly smooth surface. Final coat shall be rubbed to an eggshell gloss.

c. Cleaning of the sheet metal, application of fillers and prime coats, painting and baking shall be performed in strict accordance with the metal manufacturer's recommendations for a first class job. Finishing shall be a continuous process. Each coat of paint shall be of uniform thickness. Primer coats shall be applied using paints especially formulated for sheet metal.

152. FINISHES (Continued)

2. Sub-Level floor entrances, and including all Service Level, Mechanical Equipment Room Levels, and all other entrances opening within Service Lobbies or Utility spaces shall be field painted under another Contract. Shop painted work under this Contract for entrance work herein specified shall be:

   a. All metal work shall be thoroughly chemically cleaned of all rust, oil, grease, and other foreign matter and shall be thoroughly rinsed and dried before shop coat shall be applied.

   b. All metal shall receive one (1) shop coat of baked-on rust inhibitive primer, the color of which shall be a neutral shade.

3. All concealed surfaces of all elevator hoistway entrance doors, frames, transom panels and fixed hoistway enclosure panels, and including all surfaces of the work which shall receive stainless steel cladding shall receive one (1) shop coat of baked-on rust inhibitive primer.

B. STAINLESS STEEL - All exposed stainless steel surfaces for the Work, as hereinbefore specified, shall receive an A.I.S.I. No. 7 vertically polished mirror finish.

   1. Finish shall match the samples in the Engineer's office, and shall be subject to his approval.

   2. Wherever the Specifications require a No. 7 finish for stainless steel for hoistway entrance doors, transoms and panels, the No. 7 finish shall be modified by buffing to produce a bright "mirror-like" finish similar to the sample in the office of the Engineer. Where approved by the Engineer, the Contractor may substitute a No. 8 finish for these surfaces in lieu of the modified No. 7 finish.

C. SUB-ASSEMBLIES - All members of each sub-assembly and all structural steel frames and sub-frames, shall be finished with one shop coat of paint. The paint shall be evenly applied in sufficient thickness to cover all surfaces. After erection all abraded, damaged, and defective paint surfaces shall be recoated with the same paint as that used in the shop.

153. MOCK-UP

A. The Contractor shall furnish in place all mock-ups as hereinbefore specified under "Construction Required by the Specifications". Mock-ups shall be fully approved by the Engineer before fabrication work commences. Entrances shall be full size. After approval the entrances may be used on the job as directed by the Engineer.

154. WORKMANSHIP

A. The Contractor shall assume full and undivided responsibility for the complete installation of the elevator entrances, exclusive of the operating mechanism, and related work included under Elevator Contract No. WTC-320.00. All work required to be built into adjoining construction shall be delivered and set in place at the proper time. The sills, jambs, transoms, struts, and headers shall be set prior to erection of the walls. Door leafs shall be installed after the walls and door frames are in place.

B. FRAMES - All frames shall be installed plumb, straight, and true with horizontal lines level and vertical lines plumb. All frames shall be secured rigidly in place and shall be anchored rigidly in an approved manner.

1. Elevator entrances shall be set plumb, one above the other, and in proper relation to the elevator guide rails and the elevator operating equipment.

2. The use of cement nails, drive screws, and similar type of fastenings in the field assembly and installation will not be permitted.

C. Struts shall be fastened securely to the sills and to the underside of beams or other construction above, as approved by the Engineer.

1. Struts shall be connected to headers by means of positive fastenings of such type as to permit perfect alignment with hanger supports.

D. DOORS, TRANSOM AND FIXED HOISTWAY PANELS - All doors, transom and fixed hoistway panels shall be installed plumb and true with their frames. Doors shall operate freely without binding.

E. The Contractor shall drill and tap steel beams or other structural steel as may be encountered, for the attachment of sill brackets, jamb support brackets, and other equipment and accessories.

F. FASTENINGS - The contractor shall furnish and install all fastenings, anchors, bolts, nuts, washers, clips, and brackets as may be required to properly erect all the work included in this Contract. The fastenings and anchoring indicated on the Contract Drawings shall be considered a minimum and shall be increased in number, size and thickness as may be necessary to erect perfectly rigid, stiff and solid elevator entrances, including frames, transoms and fixed panels and doors.

154. WORKMANSHIP (Continued)

G. SCHEDULING - The Contractor shall note that elevators shall be in use as soon after erection as possible, and he shall so schedule and plan the work included under this Contract so as not to interfere with the operation of such elevators.

H. PROTECTION OF THE WORK

1. Protective Covering - All exposed finished work shall be covered properly with a protective covering of approved type strappable material which shall be lapped and taped at edges, and which shall be removed by the Contractor when directed by the Engineer. Material shall be such as to leave no discernable markings on the face of any of the finished surfaces being protected, and to cause no damage of any sort to stainless steel or baked-on enamel.

2. Stainless Steel - In addition to the protective covering as herein specified, all stainless steel shall be protected during fabrication, transportation and erection against damage from mechanical abuse, paint, plaster, salts, acids, staining from accidental contact with or drip from rusted carbon steel or other dirt by a plastic or lacquer coating as recommended by the Manufacturer. The coating shall be of a plastic type and of such composition that it may be easily removed with a solvent recommended by the Manufacturer without harming the stainless steel finishes. The Contractor shall maintain the protection with particular attention given to finishes which, once damaged, cannot be restored in the field. After grinding and polishing or where severe forming is necessary, the surfaces shall be "passivated" by a nitric acid treatment as recommended by the mill.

BILLING SCHEDULES FOR CPM

The following billing schedules conforming to the Critical Path Network for elevator installation as contained on pages F-1 to F-40 inclusive and F-56 to F-58 inclusive hereof do not include the cost for the furnishing of elevator car enclosures and the furnishing and installation of hoistway entrances.

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR NORTH TOWER
BANK "A" ZONE I

	ACTIVITY	WORK	SALE	
1.	Set Rails	18,844	57,097	
2.	Hoist. Mach. Beams	523		
3.	Hoist, Machines	523	99,146	
4.	Install Mach. Beams	523		
5.	Set Mach. & Defl. Shvs.	14,656		
6.	Install-Troughs, Cond., Contr. & Selector	16,750		
7.	Start Wiring Mach. Rm.	6,281	117,292	
8.	Wire Mach. Rm.	10,468		
9.	Complete Misc. Mach. Rm. Work	1,047		
10.	Start Car Up	6,281	-	
11.	Wash Rails	3,140	-	
12.	Install Comp. Ropes	6,281	3,984	
13.	Hoist. Wiring, Constr.	8,375	See 34	
14.	Install Door Locks	4,187	17,262	
15.	Install Defl. Screen For T/C	3,140	See 34	
16.	Hang Trav. Cable	3,140	See 34	
17.	Misc. Hoist. Work	6,281	-	
18.	Hoist. Wiring, Electr.	8,375	See 34	
19.	Install Cab	6,281	19,032	
20.	Wire Cab, Constr.	4,187	See 6	
21.	Wire Cab, Electr.	6,281	See 6	
22.	Adjustments	8,375	-	
23.	Compl. Adjust.	8,375	-	
24.	Clean Up	4,187	-	
	WORK CONCURRENT WITH ABOVE			
25.	Pit Work	5,234		
26.	Install Car Frame	5,234	90,736	
27.	Assemble Cwt. Frame	2,094		
28.	Rope Up	6,281	7,524	
29.	Install Car Conduit	5,234	See 34	
30.	Wire Platform & C/Fr.	5,234	See 34	
31.	Set Sills, Struts, Head., Bucks & Panels	-	3,984	(Hangers Only
32.	Set M. G. Sets	8,375	See 6	
33.	Compl. M. G. Install	8,375	See 6	
34.	Install Hoist. Cond. & Trough	6,281	26,557	
35.	Install Temp. Trav. Cable	523	See 34	
	TOTAL	209,366	442,614	

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR NORTH TOWER
BANK "B" ZONE 1

	ACTIVITY	WORK	SALE
1	Set Rails	20,782	62,001
2	Hoist. Mach. Beams	577	
3	Hoist. Machines	577	107,660
4	Install Mach. Beams	577	
5	Set Mach. & Defl. Shvs.	16,163	
6	Install-Troughs,Cond.,Contr. & Selector	18,472	
7	Start Wiring Mach. Rm.	6,927	127,366
8	Wire Mach. Rm.	11,545	
9	Complete Misc. Mach. Rm. Work	1,155	
10	Start Car Up	6,927	-
11	Wash Rails	3,464	
12	Install Comp. Ropes	6,927	4,326
13	Hoist. Wiring, Constr.	9,236	See 34
14	Install Door Locks	4,618	18,745
15	Install Defl. Screen For T/C	3,464	See 34
16	Hang Trav. Cable	3,464	See 34
17	Misc. Hoist. Work	6,927	-
18	Hoist. Wiring Electr.	9,236	See 34
19	Install Cab	6,927	20,667
20	Wire Cab, Constr.	4,618	See 6
21	Wire Cab, Electr.	6,927	See 6
22	Adjustments	9,236	-
23	Compl. Adjust.	9,236	-
24	Clean Up	4,618	-
	WORK CONCURRENT WITH ABOVE		
25	Pit Work	5,773	
26	Install Car Frame	5,773	98,529
27	Assemble Cwt. Frame	2,309	
28	Rope Up	6,927	8,171
29	Install Car Conduit	5,773	See 34
30	Wire Platform & C/Fr.	5,773	See 6
31	Set Sills, Struts, Head.,Bucks & Panels	-	4,326 (Hangers Onl
32	Set M.G. Sets	9,236	See 6
33	Compl. M.G. Install	9,236	See 6
34	Install Hoist. Cond. & Trough	6,927	28,838
35	Install Temp. Trav. Cable	577	See 34
	TOTAL	230,904	480,629

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR NORTH TOWER
BANK "C" ZONE I

	A C T I V I T Y	WORK	SALE	
1	Set Rails	23,656	71,045	
2	Hoist. Mach. Beams	657		
3	Hoist. Machines	657	123,364	
4	Install Mach. Beams	657		
5	Set Mach. & Defl. Shvs.	18,398		
6	Install Troughs, Cond., Contr. & Selector	21,026		
7	Start Wiring Mach. Rm.	7,885	145,944	
8	Wire Mach. Rm.	13,142		
9	Complete Misc. Mach. Rm. Work	1,314		
10	Start Car Up	7,885	-	
11	Wash Rails	3,942		
12	Install Comp. Ropes	7,885	4,957	
13	Hoist. Wiring, Constr.	10,513	See 34	
14	Install Door Locks	5,257	21,479	
15	Install Defl. Screen For T/C	3,942	See 34	
16	Hang Trav. Cable	3,942	See 34	
17	Misc. Hoist. Work	7,885	-	
18	Hoist. Wiring, Electr.	10,513	See 34	
19	Install Cab	7,885	23,682	
20	Wire Cab, Constr.	5,257	See 6	
21	Wire Cab, Electr.	7,885	See 6	
22	Adjustments	10,513	-	
23	Compl. Adjust.	10,513	-	
24	Clean Up	5,257	-	
	WORK CONCURRENT WITH ABOVE			
25	Pit Work	6,571		
26	Install Car Frame	6,571	112,901	
27	Assemble Cwt. Frame	2,628		
28	Rope Up	7,885	9,363	
29	Install Car Conduit	6,571	See 34	
30	Wire Platform & C/Fr.	6,571	See 6	
31	Set Sills, Struts, Head., Bucks & Panels	-	4,957	(Hangers Only)
32	Set M. G. Sets	10,513	See 6	
33	Compl. M. G. Install	10,513	See 6	
34	Install Hoist. Cond. & Trough	7,885	33,044	
35	Install Temp. Trav. Cable	657	See 34	
	TOTAL	262,831	550,736	

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR NORTH TOWER
BANK "D" ZONE I

	ACTIVITY	WORK	SALE	
1.	Set Rails	25,525	79,901	
2.	Hoist. Mach. Beams	709		
3.	Hoist. Machines	709	138,742	
4.	Install Mach. Beams	709		
5.	Set Mach. & Defl. Shvs.	19,850		
6.	Install Troughs, Cond., Contr. & Selector	22,685		
7.	Start Wiring Mach. Rm.	8,507	164,137	
8.	Wire Mach. Rm.	14,179		
9.	Complete Misc. Mach. Rm. Work	1,418		
10.	Start Car Up	8,507	-	
11.	Wash Rails	4,254	-	
12.	Install Comp. Ropes	8,507	5,574	
13.	Hoist. Wiring, Constr.	11,343	See 34	
14.	Install Door Locks	5,671	24,156	
15.	Install Defl. Screen For T/C	4,254	See 34	
16.	Hang Trav. Cable	4,254	See 34	
17.	Misc. Hoist. Work	8,507	-	
18.	Hoist. Wiring, Electr.	11,343	See 34	
19.	Install Cab	8,507	26,634	
20.	Wire Cab, Constr.	5,671	See 6	
21.	Wire Cab, Electr.	8,507	See 6	
22.	Adjustments	11,343	-	
23.	Compl. Adjust.	11,343	-	
24.	Clean Up	5,671	-	
	WORK CONCURRENT WITH ABOVE			
25.	Pit Work	7,089		
26.	Install Car Frame	7,089	126,974	
27.	Assemble Cwt. Frame	2,836		
28.	Rope Up	8,507	10,530	
29.	Install Car Conduit	7,089	See 34	
30.	Wire Platform & C/Fr.	7,089	See 6	
31.	Set Sills, Struts, Head., Bucks & Panels	-	5,574	(Hangers Onl
32.	Set M. G. Sets	11,343	See 6	
33.	Compl. M. G Install	11,343	See 6	
34.	Install Hoist. Cond. & Trough	8,507	37,163	
35.	Install Temp. Trav. Cable	709	See 34	
	TOTAL	283,574	619,385	

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR NORTH TOWER
BANK "A" ZONE II

	ACTIVITY	WORK	SALE
1	Set Rails	16,018	45,164
2	Hoist. Mach. Beams	445	
3	Hoist. Machines	445	78,424
4	Install Mach. Beams	445	
5	Set Mach. & Defl. Shvs.	12,458	
6	Install- Troughs, Cond., Contr., & Selector	14,238	
7	Start Wiring Mach, Rm.	5,339	92,779
8	Wire Mach. Rm.	8,899	
9	Complete Misc. Mach. Rm. Work	890	
10	Start Car Up	5,339	-
11	Wash Rails	2,670	-
12	Install. Comp. Ropes	5,339	3,151
13	Hoist. Wiring, Constr.	7,119	See 34
14	Install Door Locks	3,559	13,654
15	Install Defl. Screen For T/C	2,670	See 34
16	Hang Trav. Cable	2,670	See 34
17	Misc. Hoist. Work	5,339	-
18	Hoist. Wiring, Electr.	7,119	See 34
19	Install Cab	5,339	15,054
20	Wire Cab. Constr.	3,559	See 6
21	Wire Cab, Electr.	5,339	See 6
22	Adjustments	7,119	-
23	Compl. Adjust.	7,119	-
24	Clean Up	3,559	-
	WORK CONCURRENT WITH ABOVE		
25	Pit Work	4,449	
26	Install Car Frame	4,449	71,772
27	Assemble Cwt. Frame	1,780	
28	Rope Up	5,339	5,952
29	Install Car Conduit	4,449	See 34
30	Wire Platform & C/Fr.	4,449	See 6
31	Set Sills, Struts, Head.,Bucks & Panels	-	3,151 (Hangers Only)
32	Set M.G. Sets	7,119	See 6
33	Compl. M.G. Install	7,119	See 8
34	Install. Hoist. Cond. & Trough	5,339	21,006
35	Install Temp. Trav. Cable	445	See 34
	TOTAL	177,972	350,107

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR NORTH TOWER
BANK "B" ZONE II

	A C T I V I T Y	WORK	SALE	
1	Set Rails	18,713	56,707	
2	Hoist. Mach. Beams	520		
3	Hoist. Machines	520	98,469	
4	Install Mach. Beams	520		
5	Set Mach. & Defl. Shvs.	14,555		
6	Install Troughs, Cond., Contr. & Selector	16,634		
7	Start Wiring Mach. Rm. Work	6,238	116,492	
8	Wire Mach. Rm.	10,396		
9	Complete Misc. Mach. Rm. Work	1,040		
10	Start Car Up	6,238	-	
11	Wash Rails	3,119	-	
12	Install Comp. Ropes	6,238	3,956	
13	Hoist. Wiring, Constr.	8,317	See 34	
14	Install Door Locks	4,159	17,144	
15	Install Defl. Screen for T/C	3,119	See 34	
16	Hang Trav. Cable	3,119	See 34	
17	Misc. Hoist. Work	6,238		
18	Hoist. Wiring, Electr.	8,317	See 34	
19	Install Cab	6,238	18,902	
20	Wire Cab, Constr.	4,159	See 6	
21	Wire Cab, Electr.	6,238	See 6	
22	Adjustments	8,317	-	
23	Compl. Adjust.	8,317	-	
24	Clean Up	4,159	-	
	WORK CONCURRENT WITH ABOVE			
25	Pit Work	5,198		
26	Install Car Frame	5,198	90,117	
27	Assemble Cwt. Frame	2,079		
28	Rope-Up	6,238	7,473	
29	Install Car Conduit	5,198	See 34	
30	Wire Platform & C/Fr.	5,198	See 6	
31	Set Sills, Struts, Head., Bucks & Panels	-	3,956	(Hangers Only
32	Set M. G. Sets	8,317	See 6	
33	Compl. M. G. Install	8,317	See 6	
34	Install Hoist. Cond. & Trough	6,238	26,375	
35	Install Temp. Trav. Cable	520	See 34	
	TOTAL	207,929	439,591	

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR NORTH TOWER
BANK "C" ZONE II

	ACTIVITY	WORK	SALE	
1.	Set Rails	20,470	58,706	
2.	Hoist. Mach. Beams	569		
3.	Hoist. Machines	569	101,939	
4.	Install Mach. Beams	569		
5.	Set Mach. & Defl. Shvs.	15,922		
6.	Install Troughs, Cond., Contr. & Selector	18,197		
7.	Start Wiring Mach. Rm.	6,824	120,598	
8.	Wire Mach. Rm.	11,373		
9.	Complete Misc. Mach. Rm. Work	1,137		
10.	Start Car Up	6,824	-	
11.	Wash Rails	3,412	-	
12.	Install Comp. Ropes	6,824	4,096	
13.	Hoist. Wiring, Constr.	9,098	See 34	
14.	Install Door Locks	4,549	17,748	
15.	Install Defl. Screen For T/C	3,412	See 34	
16.	Hang Trav. Cable	3,412	See 34	
17.	Misc. Hoist. Work	6,824	-	
18.	Hoist. Wiring, Electr.	9,098	See 34	
19.	Install Cab	6,824	19,569	
20.	Wire Cab, Constr.	4,549	See 6	
21.	Wire Cab, Electr.	6,824	See 6	
22.	Adjustments	9,098	-	
23.	Compl. Adjust.	9,098	-	
24.	Clean Up	4,549	-	
	WORK CONCURRENT WITH ABOVE			
25.	Pit Work	5,687		
26.	Install Car Frame	5,687	93,292	
27.	Assemble Cwt. Frame	2,275		
28.	Rope Up	6,824	7,736	
29.	Install Car Conduit	5,687	See 34	
30.	Wire Platform & C/Fr.	5,687	See 6	
31.	Set Sills, Struts, Head., Bucks & Panels	-	4,096	(Hangers Only)
32.	Set M. G. Sets	9,098	See 6	
33.	Compl. M. G. Install	9,098	See 6	
34.	Install Hoist. Cond. & Trough	6,824	27,305	
35.	Install Temp. Trav. Cable	569	See 34	
	TOTAL	227,461	455,085	

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR NORTH TOWER
BANK "D" ZONE II

	ACTIVITY	WORK	SALE
1	Set Rails	22,569	64,294
2	Hoist. Mach. Beams	627	
3	Hoist. Machines	627	111,642
4	Install Mach. Beams	.627	
5	Set Mach. & Defl. Shvs.	17,554	
6	Install-Troughs, Cond., Contr. & Selector	20,062	
7	Start Wiring Mach. Rm.	7,523	132,076
8	Wire Mach. Rm.	12,539	
9	Complete Misc. Mach. Rm. Work	1,254	
10	Start Car Up	7,523	-
11	Wash Rails	3,762	-
12	Install Comp. Ropes	7,523	4,486
13	Hoist. Wiring, Constr.	10,031	See 34
14	Install Door Locks	5,015	19,438
15	Install Defl. Screen For T/C	3,762	See 34
16	Hang Trav. Cable	3,762	See 34
17	Misc. Hoist Work	7,523	-
18	Hoist. Wiring, Electr.	10,031	See 34
19	Install Cab	7,523	21,431
20	Wire Cab, Constr.	5,015	See 6
21	Wire Cab, Electr.	7,523	See 6
22	Adjustments	10,031	-
23	Compl. Adjust.	10,031	-
24	Clean Up	5,015	-
	WORK CONCURRENT WITH ABOVE		
25	Pit Work	6,269	
26	Install Car Frame	6,269	102,173
27	Assemble Cwt. Frame	2,508	
28	Rope Up	7,523	8,473
29	Install Car Conduit	6,269	See 34
30	Wire Platform & C/Fr.	6,269	See 6
31	Set Sills, Struts, Head., Bucks, & Panels	-	4,486 (Hangers Only)
32	Set M.G. Sets	10,031	See 6
33	Compl. M.G. Install	10,031	See 6
34	Install Hoist. Cond. & Trough	7,523	29,904
35	Install Temp. Trav. Cable	627	See 34
	TOTAL	250,771	498,403

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICE FOR NORTH TOWER
BANK "A" ZONE III

	A C T I V I T Y	WORK	SALE	
1	Set Rails	15,605	44,607	
2	Hoist. Mach. Beams	433		
3	Hoist, Machines	433	77,457	
4	Install Mach. Beams	433		
5	Set Mach. & Defl. Shvs.	12,137		
6	Install Troughs, Cond.,Contr. & Selector	13,871		
7	Start Wiring Mach. Rm.	5,201	91,636	
8	Wire Mach. Rm.	8,670		
9	Complete Misc. Mach. Rm. Work	867		
10	Start Car Up	5,201	-	
11	Wash Rails	2,601	-	
12	Install Comp. Ropes	5,201	3,112	
13	Hoist. Wiring, Constr.	6,936	See 34	
14	Install Door Locks	3,468	13,486	
15	Install Defl. Screen For T/C	2,601	See 34	
16	Hang Trav. Cable	2,601	See 34	
17	Misc. Hoist. Work	5,201	-	
18	Hoist. Wiring, Electr.	6,935	See 34	
19	Install Cab	5,201	14,869	
20	Wire Cab, Constr.	3,468	See 6	
21	Wire Cab, Electr.	5,201	See 6	
22	Adjustments	6,935	-	
23	Compl. Adjust.	6,935	-	
24	Clean Up	3,468	-	
	WORK CONCURRENT WITH ABOVE			
25	Pit Work	4,334		
26	Install Car Frame	4,334	70,887	
27	Assemble Cwt. Frame	1,734		
28	Rope Up	5,201	5,878	
29	Install Car Conduit	4,334	See 34	
30	Wire Platform & C/Fr.	4,334	See 6	
31	Set Sills, Struts, Head., Bucks & Panels	- -	3,112	(Hangers On
32	Set M. G. Sets	6,935	See 6	
33	Compl. M. G. Install	6,935	See 6	
34	Install Hoist. Cond. & Trough	5,201	20,747	
35	Install Temp. Trav. Cable	433	See 34	
	TOTAL	173,378	345,791	

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR NORTH TOWER
BANK "B" ZONE III

	ACTIVITY	WORK	SALE
1.	Set Rails	18,305	55,862
2	Hoist Mach. Beams	508	
3	Hoist, Machines	508	97,001
4	Install Mach. Beams	508	
5	Set Mach. & Defl. Shvs.	14,236	
6	Install- Troughs, Cond., Contr., & Selector	16,270	
7	Start Wiring Mach. Rm.	6,101	114,756
8	Wire Mach. Rm.	10,169	
9	Complete Misc. Mach. Rm. Work	1,017	
10	Start Car Up	6,101	-
11	Wash Rails	3,051	-
12	Install Comp. Ropes	6,101	3,897
13	Hoist. Wiring, Constr.	8,135	See 34
14	Install Door Locks	4,067	16,889
15	Install Defl. Screen For T/C	3,051	See 34
16	Hang Trav. Cable	3,051	See 34
17	Misc. Hoist Work	6,101	-
18	Hoist. Wiring, Electr.	8,135	See 34
19	Install Cab	6,101	18,621
20	Wire Cab, Constr.	4,067	See 6
21	Wire Cab, Electr.	6,101	See 6
22	Adjustments	8,135	-
23	Compl. Adjust.	8,135	-
24	Clean Up	4,067	-
	WORK CONCURRENT WITH ABOVE		
25	Pit Work	5,084	
26	Install Car Frame	5,084	88,773
27	Assemble Cwt. Frame	2,034	
28	Rope Up	6,101	7,361
29	Install Car Conduit	5,084	See 34
30	Wire Platform & C/Fr.	5,084	See 6
31	Set Sils, Struts, Head., Bucks, & Panels	-	3,897 (Hangers On)
32	Set M.G. Sets	8,135	See 6
33	Compl. M.G. Install	8,135	See 6
34	Install Hoist. Cond. & Trough	6,101	25,982
35	Install Temp. Trav. Cable	508	See 34
	TOTAL	203,371	433,039

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR NORTH TOWER
BANK "C" ZONE III

	A C T I V I T Y	WORK	SALE	
1.	Set Rails	20,057	57,864	
2.	Hoist. Mach. Beams	577		
3.	Hoist. Machines	577	100,477	
4.	Install Mach. Beams	577		
5.	Set Mach. & Defl. Shvs.	15,600		
6.	Install Troughs, Cond., Contr. & Selector	17,829		
7.	Start Wining Mach. Rm.	6,685	118,867	
8.	Wire Mach. Rm.	11,143		
9.	Complete Misc. Mach. Rm. Work	1,114		
10.	Start Car Up	6,685	-	
11.	Wash Rails	3,343	-	
12.	Install Comp. Ropes	6,685	4,037	
13.	Hoist. Wiring, Constr.	8,914	See 34	
14.	Install Door Locks	4,457	17,494	
15.	Install Defl. Screen For T/C	3,343	See 34	
16.	Hang Trav. Cable	3,343	See 34	
17.	Misc. Hoist. Work	6,685	-	
18.	Hoist. Wiring, Electr.	8,914	See 34	
19.	Install Cab	6,685	19,288	
20.	Wire Cab, Constr.	4,457	See 6	
21.	Wire Cab, Electr.	6,685	See 6	
22.	Adjustments	8,914	-	
23.	Compl. Adjust.	8,914	-	
24.	Clean Up	4,457	-	
	WORK CONCURRENT WITH ABOVE			
25.	Pit Work	5,571		
26.	Install Car Frame	5,571	91,954	
27.	Assembel Cwt. Frame	2,228		
28.	Rope Up	6,685	7,625	
29.	Install Car Conduit	5,571	See 34	
30.	Wire Platform & C/Rr.	5,571	See 6	
31.	Set Sills, Struts, Head., Bucks & Panels	-	4,037	(Hangers Only)
32.	Set M. G. Sets	8,914	See 6	
33.	Compl. M. G. Install	8,914	See 6	
34.	Install Hoist. Cond. & Trough	6,685	26,913	
35.	Install Temp. Trav. Cable	557	See 34	
	TOTAL	222,847	448,556	

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR NORTH TOWER
BANK "D" ZONE III

	ACTIVITY	WORK	SALE	
1	Set Rails	21,968	63,277	
2	Hoist. Mach. Beams	610		
3	Hoist. Machines	610	109,877	
4	Install Mach. Beams	610		
5	Set Mach. & Defl. Shvs.	17,087		
6	Instakl Troughs, Cond., Contr.,& Selector	19,527		
7	Start Wiring Mach. Rm.	7,323	129,990	
8	Wire Mach, Rm.	12,205		
9	Complete Misc. Mach, Rm. Work	1,221		
10	Start Car Up	7,323	-	
11	Wash Rails	3,662	-	
12	Install Comp. Ropes	7,323	4,415	
13	Hoist. Wiring, Constr.	9,764	See 34	
14	Install Door Locks	4,882	19,130	
15	Install Defl. Screen For T/C	3,662	See 34	
16	Hang Trav. Cable	3,662	See 34	
17	Misc. Hoist Work	7,323	-	
18	Hoist. Wiring, Electr.	9,764	See 34	
19	Install Cab	7,323	21,092	
20	Wire Cab, Constr.	4,882	See 6	
21	Wire Cab, Electr.	7,323	See 6	
22	Adjustments	9,764	-	
23	Compl. Adjust.	9,764	-	
24	Clean Up	4,882	-	
	WORK CONSURRENT WITH ABOVE			
25	Pit Work	6,103		
26	Install Car Frame	6,103	100,557	
27	Assemble Cwt. Frame	2,441		
28	Rope Up	7,323	8,339	
29	Install Car Conduit	6,103	See 34	
30	Wire Platform & C/Fr.	6,103 -	See 6	
31	Set Sills, Struts, Head.,Bucks, & Panels	-	4,415	(Hangers Only)
32	Set M.G. Sets	9,764	See 6	
33	Compl. M.G. Sets	9,764	See 6	
34	Install Hoist. Cond. & Trough	7,323	29,431	
35	Install Temp. Trav. Cable	610	See 34	
	TOTAL	244,101	490,523	

	CONFORMING TO CRITICAL PATH NETWORK FOR ELEVATOR INSTALLATION	PRICES FOR NORTH TOWER ZONE II SHUTTLES		
	A C T I V I T Y	WORK	SALE	
1	Set Rails	58,823	275,644	
2	Hoist. Mach. Beams	1,634		
3	Hoist. Machines	1,634	478,637	
4	Install Mach. Beams	1,634		
5	Set Mach. & Defl. Shvs.	45,752		
6	Install Troughs, Cond., Contr. & Selector	52,288		
7	Start Wiring Mach. Rm.	19,607	566,850	
8	Wire Mach. Rm.	32,680		
9	Complete Misc. Mach. Rm. Work	3,268		
10	Start Car Up	19,607	-	
11	Wash Rails	9,804	-	
12	Install Comp. Ropes	19,607	19,231	
13	Hoist. Wiring, Constr.	26,143	See 34	
14	Install Door Locks	13,071	83,334	
15	Install Defl. Screen for T/C	9,804	See 34	
16	Hang Trav. Cable	9,804	See 34	
17	Misc. Hoist. Work	19,607	-	
18	Hoist. Wiring Electr.	26,143	See 34	
19	Install Cab	19,607	91,881	
20	Wire Cab, Constr.	13,071	See 6	
21	Wire Cab, Electr.	19,607	See 6	
22	Adjustments	26,143	-	
23	Compl. Adjust.	26,143	-	
24	Clean Up	13,071	-	
	WORK CONCURRENT WITH ABOVE			
25	Pit Work	16,340		
26	Install Car Frame	16,340	438,039	
27	Assemble Cwt. Frame	6,536		
28	Rope Up	19,607	36,325	
29	Install Car Conduit	16,340	See 34	
30	Wire Platform & C/Fr.	16,340	See 6	
31	Set Sills, Struts, Head., Bucks & Panels	-	19,231	(Hangers On)
32	Set M. G. Sets	26,143	See 6	
33	Compl. M. G. Install	26,143	See 6	
34	Install Hoist. Cond. & Trough	19,607	128,206	
35	Install Temp. Trav. Cable	1,634	See 34	
	TOTAL	653,582	2,137,378	

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR NORTH TOWER
ZONE III SHUTTLES

ACTIVITY	WORK	SALE
1. Set Rails	75,236	322,000
2. Hoist. Mach. Beams	2,090	
3. Hoist. Machines	2,090	559,132
4. Install Mach. Beams	2,090	
5. Set Mach. & Defl. Shvs.	58,517	
6. Install- Troughs, Cond.,Contr.,& Selector	66,877	
7. Start Wiring Mach. Rm.	25,079	661,473
8. Wire Mach. Rm.	41,798	
9. Complete Misc. Mach. Rm. Work	4,180	
10. Start Car Up	25,079	
11. Wash Rails	12,540	
12. Install Comp. Ropes	25,079	22,465
13. Hoist. Wiring, Constr.	33,439	See 34
14. Install Door Locks	16,720	97,349
15. Install Defl. Screen For T/C	12,540	See 34
16. Hang Trav. Cable	12,540	See 34
17. Misc. Hoist Work	25,079	-
18. Hoist. Wiring, Electr.	33,439	See 34
19. Install Cab	25,079	107,333
20. Wire Cab, Constr.	16,720	See 6
21. Wire Cab, Electr.	25,079	See 6
22. Adjustments	33,439	-
23. Compl. Adjust.	33,439	-
24. Clean Up	16,720	-
WORK CONCURRENT WITH ABOVE		
25. Pit Work	20,899	
26. Install Car Frame	20,899	511,706
27. Assemble Cwt. Frame	8,360	
28. Rope Up	25,079	42,434
29. Install Car Conduit	20,899	See 34
30. Wire Platform & C/Fr.	20,899	See 6
31. Set Stills, Stouts,Head., Bucks, & Panels	-	22,465 (Hangers Onl
32. Set M.G. Sets	33,439	See 6
33. Compl. M.G. Install	33,439	See 6
34. Install Hoist. Cond. & Trough	25,079	149,768
35. Install Temp. Trav. Cable	2,090	See 34
TOTAL	835,970	2,496,125

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICE FOR NORTH TOWER
ZONE I FRT. #48

	ACTIVITY	WORK	SALE	
1.	Set Rails	4,639	13,093	
2.	Hoist. Mach. Beams	129		
3.	Hoist. Machines	129	22,736	
4.	Install Mach. Beams	129		
5.	Set Mach. & Defl. Shvs.	3,608		
6.	Install Troughs, Cond., Contr. & Selector	4,123		
7.	Start Wining Mach. Rm.	1,547	26,898	
8.	Wire Mach. Rm.	2,577		
9.	Complete Misc. Mach. Rm. Work	258		
10.	Start Car Up	1,547	-	
11.	Wash Rails	773	-	
12.	Install Comp. Ropes	1,547	913	
13.	Hoist. Wiring, Constr.	2,062	See 34	
14.	Install Door Locks	1,031	3,958	
15.	Install Defl. Screen For T/C	773	See 34	
16.	Hang Trav. Cable	773	See 34	
17.	Misc. Hoist. Work	1,547	-	
18.	Hoist. Wiring, Electr.	2,062	See 34	
19.	Install Cab	1,547	4,364	
20.	Wire Cab, Constr.	1,031	See 6	
21.	Wire Cab, Electr.	1,547	See 6	
22.	Adjustments	2,062	-	
23.	Compl. Adjust.	2,062	-	
24.	Clean Up	1,031	-	
	WORK CONCURRENT WITH ABOVE			
25.	Pit Work	1,289		
26.	Install Car Frame	1,289	20,807	
27.	Assemble Cwt. Frame	515		
28.	Rope Up	1,547	1,725	
29.	Install Car Conduit	1,289	See 34	
30.	Wire Platform & C/Fr.	1,289	See 6	
31.	Set Sills, Struts, Head., Bucks & Panels	-	913	(Hangers Only)
32.	Set M. G Sets	2,062	See 6	
33.	Compl. M. G. Install	2,062	See 6	
34.	Install Hoist. Cond. & Trough	1,547	6,090	
35.	Install Temp. Trav. Calbe	129	See 34	
	TOTAL	51,552	101,497	

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICE FOR NORTH TOWER
ZONE II Frt. #49

	ACTIVITY	WORK	SALE
1	Set Rails	5,577	16,187
2	Hoist. Mach. Beams	155	
3	Hoist. Machines	155	28,107
4	Install Mach. Beams	155	
5	Set Mach. & Defl. Shvs.	4,337	
6	Install Troughs, Cond., Contr. & Selector	4,957	
7	Start Wiring Mach. Rm.	1,859	33,250
8	Wire Mach. Rm.	3,098	
9	Complete Misc. Mach. Rm. Work	310	
10	Start Car Up	1,859	-
11	Wash Rails	929	-
12	Install Comp. Ropes	1,859	1,129
13	Hoist. Wiring, Constr.	2,478	See 34
14	Install Door Locks	1,239	4,894
15	Install Defl. Screen For T/C	929	See 34
16	Hang Trav. Cable	929	See 34
17	Misc. Hoist. Work	1,859	-
18	Hoist. Wiring, Electr.	2,478	See 34
19	Install Cab	1,859	5,396
20	Wire Cab, Constr.	1,239	See 6
21	Wire Cab, Electr.	1,859	See 6
22	Adjustments	2,478	-
23	Compl. Adjust.	2,478	-
24	Clean Up	1,239	-
	WORK CONCURRENT WITH ABOVE		
25	Pit Work	1,549	
26	Install Car Frame	1,549	25,723
27	Assemble Cwt. Frame	620	
28	Rope Up	1,859	2,133
29	Install Car Conduit	1,549	See 34
30	Wire Platform & C/Fr.	1,549	See 6
31	Set Sills, Struts, Head., Bucks & Panels	-	1,129 (Hangers Only
32	Set M. G. Sets	2,478	See 6
33	Compl. M. G. Install	2,478	See 6
34	Install Hoist. Cond. & Trough	1,859	7,529
35	Install Temp. Trav. Cable	155	See 34
	TOTAL	61,897	125,252

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR NORTH TOWER
ZONE III Frt. #50

	ACTIVITY	WORK	SALE
1	Set Rails	9,506	28,901
2	Hoist. Mach. Beams	264	
3	Hoist. Machines	264	50,185
4	Install Mach. Beams	264	
5	Set Mach. & Defl. Shvs.	7,394	
6	Install-Troughs,Cond.,Contr.,& Selector	8,450	
7	Start Wiring Mach. Rm.	3,169	59,372
8	Wire Mach. Rm.	5,281	
9	Complete Misc. Mach. Rm. Work	528	
10	Start Car Up	3,169	-
11	Wash Rails	1,584	-
12	Install Comp. Ropes	3,169	2,016
13	Hoist. Wiring, Constr.	4,225	See 34
14	Install Door Locks	2,113	8,738
15	Install Defl. Screen For T/C	1,584	See 34
16	Hang Trav. Cable	1,584	See 34
17	Misc. Hoist Work	3,169	-
18	Hoist. Wiring, Electr.	4,225	See 34
19	Install Cab	3,169	9,634
20	Wire cab, Constr.	2,113	See 6
21	Wire Cab, Eletr.	3,169	See 6
22	Adjustments	4,225	-
23	Compl. Adjust.	4,225	-
24	Clean Up	2,113	-
	WORK CONCURRENT WITH ABOVE		
25	Pit Work	2,641	
26	Install Car Frame	2,641	45,928
27	Assemble Cwt. Frame	1,056	
28	Rope Up	3,169	3,809
29	Install Car Conduit	2,641	See 34
30	Wire Platform & C/Rr.	2,641	See 6
31	Set Sills, Struts,Head.,Bucks, & Panels	-	2,016 (Hangers Only)
32	Set M.G. Sets	4,225	See 6
33	Compl. M.G. Install	4,225	See 6
34.	Install Hoist. Cond. & Trough	3,169	13,442
35.	Install Temp. Trav. Cable	264	See 34
	TOTAL	104,462	222,721

DRAWING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR NORTH TOWER
ELEV. #99

	A C T I V I T Y	WORK	SALE
1.	Install Rail Brackets	488	2,687
2.	Install Rails	488	
3.	Set Machine Beams	146	9,853
4.	Set Machine, Cont'r., Gen., & Selector	877	
5.	Trough Overhead	390	224
6.	Pitwork	49	
7.	Install Carframe	585	4,479
8.	Install Cwt. Frame	49	
9.	Rope Up	98	448
10.	Install Cwt. Filler Weights	98	See 8
11.	Hoistway Troughing	341	
12.	Wire C/Fr. & Motor Rm., Hang T/C	974	3,135
13.	Pipe and Wire Car	244	
14.	Start Car Up	98	
15.	Wash Rails	98	
16.	Install Door Locks	244	672
17.	Hoistway Wiring (Constructors)	341	See 11,12 &13
18.	Misc. Hoistway Work	146	-
19.	Install Cab	683	896
20.	Wiring (Electricians)	1,267	See 11,12 &13
21.	Adjustments	1,559	-
22.	Clean Up (By Otis)	488	-
	TOTAL	9,751	22,394

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICE FOR
BELOW GRADE ELEVATORS NO. P1

	A C T I V I T Y	WORK	SALE
1.	Install Rail Brackets	525	3,204
2.	Install Rails	525	
3.	Set Machine Beams	158	11,750
4.	Set Machine, Cont'r., Gen., & Selector	945	
5.	Trough Overhead	420	267
6.	Pitwork	53	5,340
7.	Install Carframe	630	
8.	Install Cwt. Frame	53	
9.	Rope Up	105	534
10.	Install Cwt. Filler Weights	105	See 8
11.	Hoistway Troughing	368	3,738
12.	Wire C/Fr. & Motor Rm., Hang T/C	1,050	
13.	Pipe and Wire Car	263	
14.	Start Car Up	105	-
15.	Wash Rails	105	-
16.	Install Door Locks	263	801
17.	Hoistway Wiring (Constructors)	368	See 11,12 &13
18.	Misc. Hoistway Work	158	-
19.	Install Cab	735	1,068
20.	Wiring (Electricians)	1,364	See 11,12 & 13
21.	Adjustments	1,679	-
22.	Clean Up (By Otis)	525	-
	TOTAL	10,502	26,702

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR
BELOW GRADE ELEVATORS NO. K3, K4, K5

	ACTIVITY	WORK	SALE
1	Install Rail Brackets	2,069	11,912
2	Install Rails	2,069	
3	Set Machine Beams	621	43,677
4	Set Machine, Cont'r., Gen., & Selector	3,724	
5	Trough Overhead	1,655	993
6	Pitwork	207	
7	Install Carframe	2,482	19,854
8	Install Cwt. Frame	207	
9	Rope Up	414	1,985
10	Install Cwt. Filler Weights	414	See 8
11	Hoistway Troughing	1,448	
12	Wire C/Fr. & Motor Rm., Hang T/C	4,137	13,898
13	Pipe and Wire Car	1,034	
14	Start Car Up	414	-
15	Wash Rails	414	-
16	Install Door Locks	1,034	2,978
17	Hoistway Wiring (Constructors)	1,448	See 11, 12 & 13
18	Misc. Hoistway Work	621	-
19	Install Cab	2,896	3,971
20	Wiring (Electricians)	5,378	See 11, 12 & 13
21	Adjustments	6,619	-
22	Clean Up (By Otis)	2,069	-
	TOTAL	41,374	99,268

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR
BELOW GRADE ELEVATORS NO. K2

	ACTIVITY	WORK	SALE
1	Install Rail Brackets	522	2,928
2	Install Rails	522	
3	Set Machine Beams	157	10,734
4	Set Machine, Cont'r.,Gen.,& Selector	939	
5	Trough Overhead	418	244
6	Pitwork	52	
7	Install Carframe	626	4,880
8	Install Cwt. Frame	52	
9	Rope Up	104	488
10	Install Cwt. Filler Weights	104	See 8
11	Hoistway Troughing	365	
12	Wire C/Fr. & Motor Rm., Hang T/C	1,044	3,416
13	Pipe and Wire Car	261	
14	Start Car Up	104	-
15	Wash Rails	104	-
16	Install Door Locks	261	732
17	Hoistway Wiring (Constructors)	365	See 11,12,&13
18	Misc. Hoistway Work	157	-
19	Install Cab	731	976
20	Wiring (Electricians)	1,357	See 11,12,&13
21	Adjustments	1,671	—
22	Clean Up (By Otis)	522	—
	TOTAL	10,438	24,398

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR SOUTH TOWER
BANK "A" ZONE I

	A C T I V I T Y	WORK	SALE	
1.	Set Rails	18,844	57,097	
2.	Hoist. Mach. Beams	523		
3.	Hoist. Machines	523	—99,146	
4.	Install Mach. Beams	523		
5.	Set Mach. & Defl. Shvs.	14,656		
6.	Install Troughs, Cond., Contr. & Selector	16,750		
7.	Start Wiring Mach. Rm.	6,281	—117,292	
8.	Wire Mach. Rm.	10,468		
9.	Complete Misc. Mach. Rm. Work	1,047		
10.	Start Car Up	6,281		
11.	Wash Rails	3,140		
12.	Install Comp. Ropes	6,281	3,984	
13.	Hoist. Wiring, Constr.	8,375	See - 34	
14.	Install Door Locks	4,187	17,262	
15.	Install Defl. Screen For T/C	3,140	See - 34	
16.	Hang Trav. Cable	3,140	See - 34	
17.	Misc. Hoist. Work	6,281		
18.	Hoist. Wiring, Electr.	8,375	See - 34	
19.	Install Cab	6,281	19,032	
20.	Wire Cab, Constr.	4,187	See - 6	
21.	Wire Cab. Electr.	6,281	See - 6	
22.	Adjustments	8,375		
23.	Compl. Adjust.	8,375		
24.	Clean Up	4,187		
	WORK CONCURRENT WITH ABOVE			
25.	Pit Work	5,234		
26.	Install Car Frame	5,234	— 90,736	
27.	Assemble Cwt. Frame	2,094		
28.	Rope Up	6,281	7,524	
29.	Install Car Conduit	5,234	See - 34	
30.	Wire Platform & C/Fr.	5,234	See - 6	
31.	Set Sills, Struts, Head., Bucks & Panels		3,984	(Hangers only
32.	Set M. G. Sets	8,375	See - 6	
33.	Compl. M. G. Install	8,375	See - 6	
34.	Install Hoist. Cond. & Trough	6,281	26,557	
35.	Install Temp. Trav. Cable	523	See - 34	
	TOTAL	209,366	442,614	

BILLING SCHEDULE
C ONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR SOUTH TOWER
BANK "B" ZONE I

	ACTIVITY	WORK	SALE
1	Set Rails	20,769	61,824
2	Hoist. Mach. Beams	577	
3	Hoist. Machines	577	107,353
4	Install Mach. Beams	577	
5	Set Mach. & Defl. Shvs.	16,154	
6	Install-Troughs ,Cond.,Contr.,& Selector	18,461	
7	Start Wiring Mach. Rm.	6,923	127,002
8	Wire Mach. Rm.	11,538	
9	Complete Misc. Mach. Rm. Work	1,154	
10	Start Car Up	6,923	
11	Wash Rails	3,461	
12	Install Comp. Ropes	6,923	4,313
13	Hoist. Wiring, Constr.	9,231	See 34
14	Install Door Locks	4,615	18,691
15	Install Defl. Screen For T/C	3,461	See 34
16	Hang Trav. Cable	3,461	See 34
17	Misc. Hoist. Work	6,923	
18	Hoist. Wiring, Electr.	9,231	See 34
19	Install Cab	6,923	20,608
20	Wire Cab, Constr.	4,615	See 6
21	Wire Cab, Electr.	6,923	See 6
22	Adjustments	9,231	
23	Compl. Adjust.	9,231	
24	Clean Up	4,615	
	WORK CONCURRENT WITH ABOVE		
25	Pit Work	5,769	
26	Install Car Frame	5,769	98,247
27	Assemble Cwt. Frame	2,308	
28	Rope Up	6,923	8,147
29	Install Car Conduit	5,769	See 34
30	Wire Platform & C/Fr.	5,769	See 6
31	Set Sills,Struts,Head.,Bucks & Panels		4,313(Hangers Only)
32	Set M.G. Sets	9,231	See 6
33	Compl. M.G. Install	9,231	See 6
34	Install Hoist. Cond., & Trough	6,923	28,755
35	Install Temp. Trav. Cable	577	See 34
	TOTAL	230,766	479,253

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR SOUTH TOWER
BANK "C" ZONE I

	A C T I V I T Y	WORK	SALE
1	Set Rails	23,471	70,524
2	Hoist. Mach. Beams	652	
3	Hoist. Machines	652	122,460
4	Install Mach. Beams	652	
5	Set Mach. & Defl. Shvs.	18,255	
6	Install Troughs, Con., Contr., & Selector	20,863	
7	Start Wiring Mach. Rm.	7,824	144,874
8	Wire Mach. Rm.	13,039	
9	Complete Misc. Mach. Rm. Work	1,304	
10	Start Car Up	7,824	
11	Wash Rails	3,912	
12	Install Comp. Ropes	7,824	4,920
13	Hoist. Wiring, Constr.	10,432	See 34
14	Install Door Locks	5,216	21,321
15	Install Defl. Screen for T/C	3,912	See 34
16	Hang Trav. Cable	3,912	See 34
17	Misc. Hoist. Work	7,824	
18	Hoist. Wiring. Electr.	10,432	See 34
19	Install Cab	7,824	23,508
20	Wire Cab, Constr.	5,216	See 6
21	Wire Cab, Electr.	7,824	See 6
22	Adjustments	10,432	
23	Compl. Adjust.	10,432	
24	Clean Up	5,216	
	WORK CONCURRENT WITH ABOVE		
25	Pit Work	6,520	
26	Install Car Frame	6,520	112,073
27	Assemble Cwt. Frame	2,607	
28	Rope Up	7,824	9,294
29	Install Car Conduit	6,520	See 34
30	Wire Platform & C/Fr.	6,520	See 6
31	Set Sills, Struts, Head., Bucks & Panels		4,920 (Hangers only)
32	Set M. G. Sets	10,432	See 6
33	Compl. M. G. Install	10,432	See 6
34	Install Hoist. Cond. & Trough	7,824	32,802
35	Install Temp. Trav. Cable	652	See 34
	TOTAL	260,795	546,696

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR SOUTH TOWER
BANK "D" ZONE I

	A C T I V I T Y	WORK	SALE	
1.	Set Rails	25,352	79,556	
2.	Hoist. Mach. Beams	704		
3.	Hoist. Machines	704	138,144	
4.	Install Mach. Beams	704		
5.	Set Mach. & Defl. Shvs.	19,717		
6.	Install Troughs, Cond., Contr. & Selector	22,535		
7.	Start Wiring Mach. Rm.	8,450	163,430	
8.	Wire Mach. Rm.	14,084		
9.	Complete Misc. Mach. Rm. Work	1,408		
10.	Start Car Up	8,450		
11.	Wash Rails	4,225		
12.	Install Comp. Ropes	8,450	5,550	
13.	Hoist. Wiring, Constr.	11,267	See - 34	
14.	Install Door Locks	5,634	24,052	
15.	Install Defl. Screen For T/C	4,225	See - 34	
16.	Hang Trav. Cable	4,225	See - 34	
17.	Misc. Hoist. Work	8,450		
18.	Hoist. Wiring, Electr.	11,267	See - 34	
19.	Install Cab	8,450	26,519	
20.	Wire Cab, Constr.	5,634	See - 6	
21.	Wire Cab, Electr.	8,450	See - 6	
22.	Adjustments	11,267		
23.	Compl. Adjust.	11,267		
24.	Clean Up	5,634		
	WORK CONCURRENT WITH ABOVE			
25.	Pit Work	7,042		
26.	Install Car Frame	7,042	126,426	
27.	Assemble Cwt. Frame	2,817		
28.	Rope Up	8,450	10,484	
29.	Install Car Conduit	7,042	See - 34	
30.	Wire Platform & C/Fr.	7,042	See - 34	
31.	Set Sills, Struts, Head, Bucks & P anels		5,550	(Hangers only)
32.	Set M. G. Sets	11,267	See - 6	
33.	Compl. M. G. Install	11,267	See - 6	
34.	Install Hoist. Cond. & Trough	8,450	37,003	
35.	Install Temp. Trav. Cable	704	See - 34	
	TOTAL	281,676	616,714	

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR SOUTH TOWER
BANK "A" ZONE II

	ACTIVITY	WORK	SALE
1	Set Rails	16,018	45,164
2	Hoist. Mach. Beams	445	
3	Hoist. Machines	445	78,424
4	Install Mach. Beams	445	
5	Set Mach. & Defl. Shvs.	12,458	
6	Install-Troughs,Cond.,Contr.,& Slector	14,238	
7	Start Wiring Mach. Rm.	5,339	92,778
8	Wire Mach. Rm.	8,899	
9	Complete Misc. Mach. Rm. Work	890	
10	Start Car Up	5,339	
11	Wash Rails	2,670	
12	Install Comp. Ropes	5,339	3,151
13	Hoist. Wiring, Constr.	7,119	See 34
14	Install Door Locks	3,559	13,654
15	Install Defl.. Screen For T/C	2,670	See 34
16	Hang Trav. Cable	2,670	See 34
17	Misc. Hoist Work	5,339	
18	Hoist. Wiring, Electr.	7,119	See 34
19	Install Cab	5,339	15,055
20	Wire Cab, Constr.	3,559	See 6
21	Wire Cab, Electr.	5,339	See 6
22	Adjustments	7,119	
23	Compl. Adjust.	7,119	
24	Clean Up	3,559	
	WORK CONCURRENT WITH ABOVE		
25	Pit Work	4,449	
26	Install Car Frame	4,449	71,772
27	Assemble Cwt. Frame	1,780	
28	Rope Up	5,339	5,952
29	Install Car Conduit	4,449	See 34
30	Wire Platform & C/Fr.	4,449	See 6
31	Set Sills, Struts,Head.,Bucks,& Panels		3,151 (Hangers Only)
32	Set M.G. Sets	7,119	See 6
33	Compl. M.G. Install	7,119	See 6
34	Install Hoist. Cond. & Trough	5,339	21,006
35	Install Temp. Trav. Cable	445	See 34
	TOTAL	177,972	350,107

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR SOUTH TOWER
BANK "B" ZONE II

	A C T I V I T Y	WORK	SALE	
1.	Set Rails	18,713	56,707	
2.	Hoist. Mach. Beams	520		
3.	Hoist. Machines	520	98,469	
4.	Install Mach. Beams	520		
5.	Set Mach. & Defl. Shvs.	14,555		
6.	Install Troughs, Cond., Contr. & Selector	16,634		
7.	Start Wiring Mach. Rm.	6,238	116,492	
8.	Wire Mach. Rm.	10,396		
9.	Complete Misc. Mach. Rm. Work	1,040		
10.	Start Car Up	6,238		
11.	Wash Rails	3,119		
12.	Install Comp. Ropes	6,238	3,956	
13.	Hoist. Wiring, Constr.	8,317	See - 34	
14.	Install Door Locks	4,159	17,144	
15.	Install Defl. Screen For T/C	3,119	See - 34	
16.	Hang Trav. Cable	3,119	See - 34	
17.	Misc. Hoist. Work	6,238		
18.	Hoist. Wiring , Electr.	8,317	See - 34	
19.	Install Cab	6,238	18,902	
20.	Wire Cab, Constr.	4,159	See - 6	
21.	Wire Cab, Electr.	6,238	See - 6	
22.	Adjustments	8,317		
23.	Compl. Adjust.	8,317		
24.	Clean Up	4,159		
	WORK CONCURRENT WITH ABOVE			
25.	Pit Work	5,198		
26.	Install Car Frame	5,198	90,117	
27.	Assemble Cwt. Frame	2,079		
28.	Rope Up	6,238	7,473	
29.	Install Car Conduit	5,198	See - 34	
30.	Wire Platform & C/Fr.	5,198	See - 6	
31.	Set Sills, Struts, Head., Bucks & Panels		3,956	(HANGERS ONLY)
32.	Set M. G. Sets	8,317	See - 6	
33.	Compl. M. G. Install	8,317	See - 6	
34.	Install Hoist. Cond. & Trough	6,238	26,375	
35.	Install Temp. Trav. Cable	520	See - 34	
	TOTAL	207,929	439,591	

BILLING SCHEDULE

CONFORMING TO CRITICAL PATH NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR SOUTH TOWER BANK "C" ZONE II

	ACTIVITY	WORK	SALE	
		20,251	58,271	
1	Set Rails	563		
2	Hoist. Mach. Beams	563	101,183	
3	Hoist. Machines	563		
4	Install Mach. Beams	15,751		
5	Set Mach. & Defl. Shvs.	18,001		
6	Imstall Troughs, Cons., Contr. & Selector	6,751	119,704	
7	Start Wiring Mach. Rm.	11,250		
8	Wire Mach. Rm.	1,124		
9	Complete Misc. Mach. Rm. Work	6,751		
10	Start Car Up	3,375		
11	Wash Rails	6,751	4,065	
12	Install Comp. Ropes	9,001	See 34	
13	Hoist. Wiring, Constr.	4,501	17,617	
14	Install Door Locks	3,375	See 34	
15	Install Defl. Screen For T/C	3,375	See 34	
16	Hang Trav. Cable	6,751		
17	Misc. Hoist. Work	9,001	See 34	
18	Hoist. Wiring, Electr.	6,751	19,424	
19	Install Cab	4,501	See 6	
20	Wire Cab, Constr.	6,751	See 6	
21	Wire Cab, Electr.	9,001		
22	Adjustments	9,001		
23	Compl. Adjust.	4,501		
24	Clean Up			
	WORK CONCURRENT WITH ABOVE			
25	Pit Work	5,626		
26	Install Car Frame	5,626	92,601	
27	Assemble Cwt. Frame	2,250		
28	Rope Up	6,751	7,679	
29	Install Car Conduit	5,626	See 34	
30	Wire Platform & Cr.	5,626	See 6	
31	Set Sills, Struts Head, Bucks & Panels		4,065	(Hangers only)
32	Set M. G. Sets	9,001	See 6	
33	Compl. M. G. Install	9,001	See 6	
34	Install Hoist. Cond. & Trough	6,751	27,103	
35	Install Temp. Trav. Cable	563	See 34	
	TOTAL	225,025	451,712	

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR SOUTH TOWER
BANK "D" ZONE II

	A C T I V I T Y	WORK	SALE	
1.	Set Rails	22,081	63,378	
2.	Hoist. Mach. Beams	613		
3.	Hoist. Machines	613	110,052	
4.	Install Mach. Beams	613		
5.	Set Mach. & Defl. Shvs.	17,173		
6.	Install Troughs, Cond., Contr. & Selector	19,627		
7.	Start Wiring Mach. Rm.	7,360	130,195	
8.	Wire Mach. Rm.	12,267		
9.	Complete Misc. Mach. Rm. Work	1,227		
10.	Start Car Up	7,360		
11.	Wash Rails	3,680		
12.	Install Comp. Ropes	7,360	4,422	
13.	Hoist. Wiring, Constr.	9,813	See - 34	
14.	Install Door Locks	4,907	19,161	
15.	Install Defl. Screen For T/C	3,680	See - 34	
16.	Hang Trav. Cable	3,680	See - 34	
17.	Misc. Hoist, Work	7,360		
18.	Hoist, Wiring, Electr.	9,813	See - 34	
19.	Install Cab	7,360	21,126	
20.	Wire Cab, Constr.	4,907	See - 6	
21.	Wire Cab, Electr.	7,360	See - 6	
22.	Adjustments	9,813		
23.	Compl. Adjust.	9,813		
24.	Clean Up	4,907		
	WORK CONCURRENT WITH ABOVE			
25.	Pit Work	6,133		
26.	Install Car Frame	6,133	100,717	
27.	Assemble Cwt. Frame	2,453		
28.	Rope Up	7,360	8,352	
29.	Install Car Conduit	6,133	See - 34	
30.	Wire Platform & C/Fr.	6,133	See - 6	
31.	Set Sills, Struts, Head., Bucks & Panels		4,422	(HANGERS ONLY
32.	Set M. G. Sets	9,813	See - 6	
33.	Compl. M. G. Install	9,813	See - 6	
34.	Install Hoist. Cond. & Trough	7,360	29,478	
35.	Install Temp. Trav. Cable	613	See - 34	
	TOTAL	245,331	491,303	

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR SOUTH TOWER
BANK "A" ZONE III

	ACTIVITY	WORK	SALE
1	Set Rails	15,622	44,580
2	Hoist. Mach Beams	434	
3	Hoist. Machines	434	77,410
4	Install Mach. Beams	434	
5	Set Mach. & Defl. Shvs.	12,150	
6	Install-Troughs,Cond.,Contr.,& Selector	13,886	
7	Start Wiring Mach Rm.	5,208	91,577
8	Wire Mach. Rm.	8,679	
9	Complete Misc. Mach. Rm. Work	868	
10	Start Car Up	5,208	
11	Wash Rails	2,604	
12	Install Comp. Ropes	5,208	3,110
13	Hoist. Wiring, Constr.	6,944	See 34
14	Install Door Locks	3,472	13,478
15	Install Defl. Screen For T/C	2,604	See 34
16	Hang Trav. Cable	2,604	See 34
17	Misc. Hoist. Work	5,208	
18	Hoist. Wiring, Electr.	6,944	See 34
19	Install Cab	5,208	14,860
20	Wire Cab, Constr.	3,472	See 6
21	Wire Cab, Electr.	5,208	See 6
22	Adjustments	6,944	
23	Compl. Adjust.	6,944	
24	Clean Up	3,472	
	WORK CONCURRENT WITH ABOVE		
25	Pit Work	4,340	
26	Install Car Frame	4,340	70,844
27	Assemble Cwt. Frame	1,735	
28	Rope Up	5,208	5,875
29	Install Car Conduit	4,340	See 34
30	Wire Platform & C/Ft.	4,340	See 6
31	Set Sills, struts, Head.,Bucks,&Panels		3,110 (Hangers Only)
32	Set M.G. Sets	6,944	See 6
33	Compl. M.G. Install	6,944	See 6
34	Install Hoist. Cond. & Trough	5,208	20,735
35	Install Temp. Trav. Cable	434	See 34
	TOTAL	173,592	345,579

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR SOUTH TOWER
BANK "B" ZONE III

	ACTIVITY	WORK	SALE
1	Set Rails	18,303	55,862
2	Hoist. Mach. Beams	508	
3	Hoist. Machines	508	97,001
4	Install Mach. Beams	508	
5	Set Mach. & Defl. Shvs.	14,237	
6	Install-Troughs, Cond., Contr.,& Selector	16,271	
7	Start Wiring Mach. Rm.	6,101	114,755
8	Wire Mach. Rm.	10,169	
9	Complete Misc. Mach. Rm. Work	1,017	
10	Start Car Up	6,101	
11	Wash Rails	3,051	
12	Install Comp. Ropes	6,101	3,897
13	Hoist. Wiring, Constr.	8,135	See 34
14	Install Door Locks	4,067	16,889
15	Install Defl. Screen For T/C	3,051	See 34
16	Hang Trav. Cable	3,051	See 34
17	Misc. Hoist. Work	6,101	
18	Hoist. Wiring, Electr.	8,135	See 34
19	Install Cab	6,101	18,621
20	Wire Cab, Constr.	4,067	See 6
21	Wire Cab, Electr.	6,101	See 6
22	Adjustments	8,135	
23	Compl. Adjust.	8,135	
24	Clean Up	4,067	
	WORK CONCURRENT WITH ABOVE		
25	Pit Work	5,084	
26	Install Car Frame	5,084	88,773
27	Assemble Cwt. Frame	2,034	
28	Rope Up	6,101	7,362
29	Install Car Conduit	5,084	See 34
30	Wire Platform & C/Fr.	5,084	See 6
31	Set Sills, Struts, Head, Bucks & Panels		3,897 (Hangers Only)
32	Set M.G. Sets	8,135	See 6
33	Compl. M.G. Install	8,135	See 6
34	Install Hoist. Cond. & Trough	6,101	25,982
35	Install Temp. Trav. Cable	508	See 34
	TOTAL	203,371	433,039

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR SOUTH TOWER
BANK "C" ZONE III

	A C T I V I T Y	WORK	SALE	
1.	Set Rails	20,057	57,864	
2.	Hoist. Mach. Beams	557		
3.	Hoist. Machines	557	100,477	
4.	Install Mach. Beams	557		
5.	Set Mach. & Defl. Shvs.	15,600		
6.	Install Troughs, Cond., Contr. & Selector	17,829		
7.	Start Wiring Mach. Rm.	6,685	118,867	
8.	Wire Mach. Rm.	11,143		
9.	Complete Misc. Mach. Rm. Work	1,114		
10.	Start Car Up	6,685	-	
11.	Wash Rails	3,343	-	
12.	Install Comp. Ropes	6,685	4,037	
13.	Hoist. Wiring, Constr.	8,914	See 34	
14.	Install Door Locks	4,457	17,494	
15.	Install Defl. Screen For T/C	3,343	See 34	
16.	Hang Trav. Cable	3,343	See 34	
17.	Misc. Hoist. Work	6,685	-	
18.	Hoist. Wiring, Electr.	8,914	See 34	
19.	Install Cab	6,685	19,288	
20.	Wire Cab, Constr.	4,457	See 6	
21.	Wire Cab, Electr.	6,685	See 6	
22.	Adjustments	8,914	-	
23.	Compl. Adjust.	8,914	-	
24.	Clean Up	4,457	-	
	WORK CONCURRENT WITH ABOVE			
25.	Pit Work	5,571		
26.	Install Car Frame	5,571	91,954	
27.	Assemble Cwt. Frame	2,228		
28.	Rope Up	6,685	7,625	
29.	Install Car Conduit	5,571	See 34	
30.	Wire Platform & C/Fr.	5,571	See 6	
31.	Set Sills, Struts, Head., Bucks & Panels	-	4,037	(Hangers Only)
32.	Set M. G. Sets	8,914	See 6	
33.	Compl. M. G. Install	8,914	See 6	
34.	Install Hoist. Cond. & Trough	6,685	26,913	
35.	Install Temp. Trav. Cable	557	See 34	
	TOTAL	222,847	448,556	

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR SOUTH TOWER
BANK "D" ZONE III

	A C T I V I T Y	WORK	SALE	
1.	Set Rails	21,964	63,176	
2.	Hoist. Mach. Beams	610		
3.	Hoist. Machines	610	109,702	
4.	Install Mach. Beams	610		
5.	Set Mach. & Defl. Shvs.	17,082		
6.	Install Troughs, Cond., Contr. & Selector	19,523		
7.	Start Wiring Mach. Rm.	7,321	129,780	
8.	Wire Mach. Rm.	12,202		
9.	Complete Misc. Mach. Rm. Work	1,220		
10.	Start Car Up	7,321	-	
11.	Wash Rails	3,660	-	
12.	Install Comp. Ropes	7,321	4,408	
13.	Hoist. Wiring, Constr.	9,761	See 34	
14.	Install Door Locks	4,881	19,100	
15.	Install Defl. Screen For T/C	3,660	See 34	
16.	Hang Trav. Cable	3,660	See 34	
17.	Misc. Hoist. Work	7,321	-	
18.	Hoist. Wiring, Electr.	9,761	See 34	
19.	Install Cab	7,321	21,059	
20.	Wire Cab, Constr	4,881	See 6	
21.	Wire Cab, Electr.	7,321	See 6	
22.	Adjustments	9,761	-	
23.	Compl. Adjust.	9,761	-	
24.	Clean Up	4,881	-	
	WORK CONCURRENT WITH ABOVE			
25.	Pit Work	6,101		
26.	Install Car Frame	6,101	100,397	
27.	Assemble Cwt. Frame	2,440		
28.	Rope Up	7,321	8,326	
29.	Install Car Conduit	6,101	See 34	
30.	Wire Platform & C/T	6,101	See 6	
31.	Set Sills, Struts, Head, Bucks & Panels	-	4,408	(Hangers Only)
32.	Set M. G. Sets	9,761	See 6	
33.	Compl. M. G. Install	9,761	See 6	
34.	Install Hoist. Cond. & Trough	7,321	29,384	
35.	Install Temp. Trav. Cable	610	See 34	
	TOTAL	244,032	489,740	

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR SOUTH TOWER
ZONE II SHUTTLES

	ACTIVITY	WORK	SALE	
1	Set Rails	58,757	276,820	
2	Hoist. Mach. Beams	1,632		
3	Hoist. Machines	1,632	480,680	
4	Install Mach. Beams	1,632		
5	Set Mach. & Defl. Shvs.	45,700		
6	Install-Troughs, Cond.,Contr. & Selector	52,228		
7	Start Wiring Mach. Rm.	19,586	568,662	
8	Wire Mach. Rm.	32,643		
9	Complete Misc. Mach. Rm. Work	3,264		
10	Start Car Up	19,586		
11	Wash Rails	9,793		
12	Install Comp. Ropes	19,586	19,313	
13	Hoist. Wiring, Constr.	26,114	See 34	
14	Install Door Locks	13,057	83,690	
15	Install Defl. Screen For T/C	9,793	See 34	
16	Hang Trav. Cable	9,793	See 34	
17	Misc. Hoist. Work	19,586		
18	Hoist. Wiring, Electr.	26,114	See 34	
19	Install Cab	19,586	92,273	
20	Wire Cab, Constr.	13,057	See 6	
21	Wire Cab, Electr.	19,586	See 6	
22	Adjustments	26,114		
23	Compl. Adjust.	26,114		
24	Clean Up	13,057		
	WORK CONCURRENT WITH ABOVE			
25	Pit Work	16,321		
26	Install Car Frame	16,321	439,908	
27	Assemble Cwt. Frame	6,529		
28	Rope Up	19,586	36,480	
29	Install Car Conduit	16,321	See 34	
30	Wire Platform & C/Fr .	16,321	See 6	
31	Set Sills, Struts, Head., Bucks & Panels		19,313	(Hangers Only)
32	Set M.G. Sets	26,114	See 6	
33	Compl. M.G. Install	26,114	See 6	
34	Install Hoist. Cond. & Trough	19,586	128,754	
35	Install Temp. Trav. Cable	1,632	See 34	
	TOTAL	652,855	2,145,893	

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR SOUTH TOWER ZONE III SHUTTLES

	ACTIVITY	WORK	SALE	
1.	Set Rails	73,136	322,962	
2.	Hoist. Mach. Beams	2,032		
3.	Hoist. Machines	2,032	560,803	
4.	Install Mach. Beams	2,032		
5.	Set Mach. & Defl. Shvs.	56,883		
6.	Install Troughs, Cond., Contr. & Selector	65,009		
7.	Start Wiring Mach. Rm.	24,379	663,450	
8.	Wire Mach. Rm.	40,631		
9.	Complete Misc. Mach. Rm. Work	4,063		
10.	Start Car Up	24,379	-	
11.	Wash Rails	12,189	-	
12.	Install Comp. Ropes	24,379	22,532	
13.	Hoist. Wiring, Constr.	32,505	See 34	
14.	Install Door Locks	16,253	97,640	
15.	Install Defl. Screen For T/C	12,189	See 34	
16.	Hang Trav. Cable	12,189	See 34	
17.	Misc. Hoist. Work	24,379	-	
18.	Hoist. Wiring, Electr.	32,505	See 34	
19.	Install Cab	24,379	107,654	
20.	Wire Cab, Constr.	16,253	See 6	
21.	Wire Cab, Electr.	24,379	See 6	
22.	Adjustments	32,505	-	
23.	Compl. Adjust.	32,505	-	
24.	Clean Up	16,253	-	
	WORK CONCURRENT WITH ABOVE			
25.	Pit Work	20,316		
26.	Install Car Frame	20,316	513,235	
27.	Assemble Cwt. Frame	8,126		
28.	Rope Up	24,379	42,561	
29.	Install Car Conduit	20,316	See 34	
30.	Wire Platform & C/F	20,316	See 6	
31.	Set Sills, Struts, Head., Bucks & Panels	-	22,532	(Hangers Only)
32.	Set M. G. Sets	32,505	See 6	
33.	Compl. M. G. Install	32,505	See 6	
34.	Install Hoist. Cond. & Trough	24,379	150,215	
35.	Install Temp. Trav. Cable	2,032	See 34	
	TOTAL	812,628	2,503,584	

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR SOUTH TOWER
ZONE 1 FRT. (#48)

	ACTIVITY	WORK	SALE	
1	Set Rails	4,639	13,093	
2	Hoist. Mach. Beams	129		
3	Hoist. Machines	129	22,736	
4	Install Mach. Beams	129		
5	Set Mach. & Defl. Shvs.	3,608		
6	Install-Troughs, Cond.,Contr. & Selector	4,123		
7	Start Wiring Mach. Rm.	1,547	26,898	
8	Wire Mach. Rm.	2,577		
9	Complete Misc. Mach. Rm. Work	258		
10	Start Car Up	1,547		
11	Wash Rails	773		
12	Install Comp. Ropes	1,547	913	
13	Hoist. Wiring, Constr.	2,062	See 34	
14	Install Door Locks	1,031	3,958	
15	Install Defl. Screen For T/C	773	See 34	
16	Hang Trav. Cable	773	See 34	
17	Misc. Hoist. Work	1,547		
18	Hoist. Wiring, Electr.	2,062	See 34	
19	Install Cab	1,547	4,364	
20	Wire Cab, Constr.	1,031	See 6	
21	Wire Cab, Electr.	1,547	See 6	
22	Adjustments	2,062		
23	Compl. Adjust.	2,062		
24	Clean Up	1,031		
	WORK CONCURRENT WITH ABOVE			
25	Pit Work	1,289		
26	Install Car Frame	1,289	20,807	
27	Assemble Cwt. Frame	515		
28	Rope Up	1,547	1,725	
29	Install Car Conduit	1,289	See 34	
30	Wire Platform & C/Fr.	1,289	See 6	
31	Set Sills, Struts, Head., Bucks & Panels		913	(Hangers Only)
32	Set M.G. Sets	2,062	See 6	
33	Compl. M.G. Install	2,062	See 6	
34	Install Hoist. Cond. & Trough	1,547	6,090	
35	Install Temp. Trav. Cable	129	See 34	
	TOTAL	51,552	101,497	

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR SOUTH TOWER
ZONE II Frt. (#49)

	ACTIVITY	WORK	SALE	
1.	Set Rails	5,570	16,158	
2.	Hoist. Mach. Beams	155		
3.	Hoist, Machines	155	28,056	
4.	Install Mach. Beams	155		
5.	Set Mach. & Defl. Shvs.	4,333		
6.	Install Troughs, Cond., Contr. & Selector	4,952		
7.	Start Wiring Mach. Rm.	1,857	33,192	
8.	Wire Mach. Rm.	3,095		
9.	Complete Misc. Mach. Rm. Work	310		
10.	Start Car Up	1,857		
11.	Wash Rails	928		
12.	Install Comp. Ropes	1,857	1,127	
13.	Hoist. Wiring, Constr.	2,476	See - 34	
14.	Install Door Locks	1,238	4,885	
15.	Install Defl. Screen For T/C	928	See - 34	
16.	Hang Trav. Cable	928	See - 34	
17.	Misc. Hoist. Work	1,857	-	
18.	Hoist. Wiring, Electr.	2,476	See - 34	
19.	Install Cab	1,857	5,386	
20.	Wire Cab, Constr.	1,238	See - 6	
21.	Wire Cab, Electr.	1,857	See - 6	
22.	Adjustments	2,476	-	
23.	Compl. Adjust.	2,476	-	
24.	Clean Up	1,238	-	
	WORK CONCURRENT WITH ABOVE			
25.	Pit Work	1,547		
26.	Install Car Frame	1,547	25,677	
27.	Assemble Cwt. Frame	619		
28.	Rope Up	1,857	2,129	
29.	Install Car Conduit	1,547	See - 34	
30.	Wire Platform & C/Fr.	1,547	See - 6	
31.	Set Sills, Struts, Head., Bucks & Panels	-	1,127	(Hangers only)
32.	Set M. G. Sets	2,476	See - 6	
33.	Compl. M. G. Install	2,476	See - 6	
34.	Install Hoist. Cond. & Trough	1,857	7,515	
35.	Install Temp. Trav. Cable	155	See - 34	
	TOTAL	61,897	125,252	

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR SOUTH TOWER
ZONE III FRT. (#50)

	ACTIVITY	WORK	SALE
1	Set Rails	9,403	28,731
2	Hoist. Mach. Beams	261	
3	Hoist. Machines	261	49,890
4	Install Mach. Beams	261	
5	Set Mach. & Defl. Shvs.	7,312	
6	Install-Troughs, Cond.,Contr. & Selector	8,358	
7	Start Wiring Mach. Rm.	3,134	59,022
8	Wire Mach. Rm.	5,223	
9	Complete Misc. Mach. Rm. Work	522	
10	Start Car Up	3,134	
11	Wash Rails	1,567	
12	Install Comp. Ropes	3,134	2,004
13	Hoist. Wiring, Constr.	4,178	See 34
14	Install Door Locks	2,089	8,686
15	Install Defl. Screen For T/C	1,567	See 34
16	Hang Trav. Cable	1,567	See 34
17	Misc. Hoist. Work	3,134	
18	Hoist. Wiring, Electr.	4,178	See 34
19	Install Cab	3,134	9,577
20	Wire Cab, Constr.	2,089	See 6
21	Wire Cab, Electr.	3,134	See 6
22	Adjustments	4,178	
23	Compl. Adjust.	4,178	
24	Clean Up	2,089	
	WORK CONCURRENT WITH ABOVE		
25	Pit Work	2,612	
26	Install Car Frame	2,612	45,658
27	Assemble Cwt. Frame	1,044	
28	Rope Up	3,134	3,786
29	Install Car Conduit	2,612	See 34
30	Wire Platform & C/Fr.	2,612	See 6
31	Set Sills, Struts, Head., Bucks & Panels		2,004 (Hangers Only)
32	Set M.G. Sets	4,178	See 6
33	Compl. M.G. Install	4,178	See 6
34	Install Hoist. Cond. & Trough	3,134	13,363
35	Install Temp. Trav. Cable	261	See 34
	TOTAL	104,462	222,721

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ELEVATOR INSTALLATION

PRICES FOR SOUTH TOWER
ELEVATOR NO. 99

	ACTIVITY	WORK	SALE
1	Install Rail Brackets	488	2,687
2	Install Rails	488	
3	Set Machine Beams	146	9,853
4	Set Machine, Cont'r., Gen., & Selector	877	
5	Trough Overhead	390	224
6	Pitwork	49	
7	Install Carframe	585	4,479
8	Install Cwt. Frame	49	
9	Rope Up	98	448
10	Install Cwt. Filler Weights	98	See 8
11	Hoistway Troughing	341	
12	Wire C/Fr. & Motor Rm. Hang T/C	975	3,135
13	Pipe and Wire Car	244	
14	Start Car Up	98	
15	Wash Rails	98	
17	Install Door Locks	244	672
18	Hoistway Wiring (Constructors)	341	See 11, 12 & 13
19	Misc. Hoistway Work	146	
20	Install Cab	683	896
21	Wiring (Electricians)	1,267	See 11, 12 & 13
22	Adjustments	1,559	
23	Clean Up (By Otis)	488	
	TOTAL	9,752	22,394

UNIT PRICES FOR MAJOR COMPONENTS REQUIRED FOR BILLING PRE-MANUFACTURED MATERIALS

ZONE	BANK	BUFFERS	MACHINES	MOTOR GENERATORS	CONTROLLERS & SELECTORS	GOVENORS	CAR FRAMES & SAFETIES	CWTS. & *SAFETIES	PLATFORMS	CAR & CWT. RAILS PER FOOT
I	A	1,538	16,091	6,753	12,821	1,650	1,484	2,344	633	14.95
I	B	1,607	16,091	6,753	15,259	1,650	1,484	2,344	633	19.00
I	C	1,714	23,390	6,753	15,551	1,650	1,484	2,344	633	19.00
I	D	2,031	23,390	13,693	15,551	3,518	1,484	2,344	633	19.00
II	A	932	8,003	2,808	13,219	979	1,441	2,208	633	14.95
II	B	1,538	16,091	6,753	12,821	1,650	1,484	2,344	633	14.95
II	C	1,538	16,091	6,753	12,821	1,650	1,484	2,344	633	14.95
II	D	1,607	16,091	6,753	15,259	1,650	1,484	2,344	633	19.00
III	A	932	8,003	2,808	13,219	979	1,441	2,208	633	14.95
III	B	1,538	16,091	6,753	12,821	1,650	1,484	2,344	633	14.95
III	C	1,538	16,091	6,753	12,821	1,650	1,484	2,344	633	14.95
III	D	1,607	16,091	6,753	15,259	1,650	1,484	2,344	633	19.00
SHUTTLES		3,729	68,230	31,001	26,326	3,518	4,177	6,791	1,145	24,85
FRT	48	1,332	23,390	6,753	11,989	2,360	1,903	2,361	601	19.00
FRT	49	3,242	23,390	13,693	14,463	2,360	2,011	2,388	601	19.00
FRT	50	1,734	68,230	13,693	28,833	1,793	4,177	2,735	617	19.00

* No Counterweight Safety for Freight Car #50

NOIE: Unit prices quoted are per elevator, except that car and counterweight rails are per foot of rise

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ESCALATOR INSTALLATION

PRICES FOR
ESCALATORS NO. A1 - A2

	ACTIVITY	WORK	SALE
A	Install Truss	1,629	11,034
B	Set Drive Carriage	1,357	
C	Set Tracks & Brackets	4,073	24,275
D	Set Newels	1,357	
E	Set Balustrade Brackets	1,357	
F	Install Decking	1,629	11,034
I	Install Chains	814	47,446
J	Install Steps	814	
K	Set Floor Plates	1,357	3,310
L	Install Skirt Boards	4,073	3,310
M	Set Hand Rails	543	5,517
N	Adjustments	1,357	
O	Install Interior Panels	1,629	See - L
P	Cleanup	543	
	WORK CONCURRENT WITH ABOVE		
G	Set Machine & Controller	814	See - C
H	Wiring	2,173	4,414
Q	Wiring (Electricians)	1,629	
	TOTAL	27,148	110,340

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ESCALATOR INSTALLATION

PRICES FOR
ESCALATORS NO. A3-A4

ACTIVITY	WORK	SALE
A Install Truss	1,223	6,118
B Set Drive Carriage	1,019	
C Set Tracks & Brackets	3,055	13,459
D Set Newels	1,019	
E Set Balustrade Brackets	1,019	
F Install Decking	1,223	6,118
I Install Chains	611	26,306
J Install Steps	611	
K Set Floor Plates	1,019	1,835
L Install Skirt Boards	3,055	1,835
M Set Hand Rails	408	3,059
N Adjustments	1,019	
O Install Interior Panels	1,223	See L
P Cleanup	408	
WORK CONCURRENT WITH ABOVE		
G Set Machine & Controller	611	See C
H Wiring	1,630	2,447
Q Wiring (Electricians)	1,223	
TOTAL	20,376	61,177

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ESCALATOR INSTALLATION

PRICES FOR
ESCALATOR NO. A5-A6

	ACTIVITY	WORK	SALE
A	Install Truss	1,228	5,864
B	Set Drive Carriage	1,023	
C	Set Tracks & Brackets	3,069	12,902
D	Set Newels	1,023	
E	Set Balustrade Brackets	1,023	
F	Install Decking	1,228	5,864
I	Install Chains	614	25,218
J	Install Steps	614	
K	Set Floor Plates	1,023	1,759
L	Install Skirt Boards	3,069	1,759
M	Set Hand Rails	409	2,932
N	Adjustments	1,023	
O	Install Interior Panels	1,228	See - L
P	Cleanup	409	
	WORK CONCURRENT WITH ABOVE		
G	Set Machine & Controller	614	See - C
H	Wiring	1,637	2,346
Q	Wiring (Electricians)	1,228	
	TOTAL	20,462	58,644

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ESCALATOR INSTALLATION

PRICES FOR
ESCALATORS NO. A7 - A8

ACTIVITY	WORK	SALE
A Install Truss	1,181	5,575
B Set Drive Carriage	984	
C Set Tracks & Brackets	2,952	12,266
D Set Newels	984	
E Set Balustrade Brackets	984	
F Install Decking	1,181	5,575
I Install Chains	590	23,974
J Install Steps	590	
K Set Floor Plates	984	1,673
L Install Skirt Boards	2,952	1,673
M Set Hand Rails	394	2,788
N Adjustments	984	
O Install Interior Panels	1,181	See L
P Cleanup	394	
WORK CONCURRENT WITH ABOVE		
G Set Machine & Controller	590	See C
H Wiring	1,574	2,230
Q Wiring (Electricians)	1,181	
TOTAL	19,680	55,754

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ESCALATOR INSTALLATION

PRICE FOR
ESCALATORS NO. A-9 - A-10

	ACTIVITY	WORK	SALE
A	Install Truss	1,228	5,864
B	Set Drive Carriage	1,023	
C	Set Tracks & Brackets	3,069	12,902
D	Set Newels	1,023	
E	Set Balustrade Brackets	1,023	
F	Install Decking	1,228	5,864
I	Install Chains	614	25,218
J	Install Steps	614	
K	Set Floor Plates	1,023	1,759
L	Install Skirt Boards	3,069	1,759
M	Set Hand Rails	409	2,932
N	Adjustments	1,023	
O	Install Interior Panels	1,228	See - L
P	Cleanup	409	
	WORK CONCURRENT WITH ABOVE		
G	Set Machine & Controller	614	See - C
H	Wiring	1,637	2,346
Q	Wiring (Electricians)	1,228	
	TOTAL	20,462	58,644

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ESCALATOR INSTALLATION

PRICES FOR
ESCALATORS NO. B1 - B2

ACTIVITY	WORK	SALE
A Install Truss	1,629	11,034
B Set Drive Carriage	1,357	
C Set Tracks & Brackets	4,073	24,275
D Set Newels	1,357	
E Set Balustrade Brackets	1,357	
F Install Decking	1,629	11,034
I Install Chains	814	47,446
J Install Steps	814	
K Set Floor Plates	1,357	3,310
L Install Skirt Boards	4,073	3,310
M Set Hand Rails	543	5,517
N Adjustments	1,357	
O Install Interior Panels	1,629	See L
P Cleanup	543	
WORK CONCURRENT WITH ABOVE		
G Set Machine & Controller	814	See C
H Wiring	2,173	4,414
Q Wiring (Electricians)	1,629	
TOTAL	27,148	110,340

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ESCALATOR INSTALLATION

PRICES FOR
ESCALATORS NO. B3 - B4

ACTIVITY	WORK	SALE
A Install Truss	1,171	5,524
B Set Drive Carriage	976	
C Set Tracks & Brackets	2,927	12,152
D Set Newels	976	
E Set Balustrade Brackets	976	
F Install Decking	1,171	5,524
I Install Chains	584	23,752
J Install Steps	584	
K Set Floor Plates	976	1,657
L Install Skirt Boards	2,927	1,657
M Set Hand Rails	390	2,762
N Adjustments	976	
O Install Interior Panels	1,171	See L
P Cleanup	390	
WORK CONCURRENT WITH ABOVE		
G Set Machine & Controller	584	See C
H Wiring	1,560	2,210
Q Wiring (Electricians)	1,171	
TOTAL	19,510	55,238

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ESCALATOR INSTALLATION

PRICE FOR
ESCALATORS NO. B5 - B6

	A C T I V I T Y	WORK	SALE
A	Install Truss	1,228	5,864
B	Set Drive Carriage	1,023	
C	Set Tracks & Brackets	3,069	12,902
D	Set Newels	1,023	
E	Set Balustrade Brackets	1,023	
F	Install Decking	1,228	5,864
I	Install Chains	614	25,218
J	Install Steps	614	
K	Set Floor Plates	1,023	1,759
L	Install Skirt Boards	3,069	1,759
M	Set Hand Rails	409	2,932
N	Adjustments	1,023	--
O	Install Interior Panels	1,228	See - L
P	Cleanup	409	--
	WORK CONCURRENT WITH ABOVE		
G	Set Machine & Controller	614	See - C
H	Wiring	1,637	2,346
Q	Wiring (Electricians)	1,228	
	TOTAL	20,462	58,644

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ESCALATOR INSTALLATION

PRICES FOR
ESCALATORS NO. B7 - B8

	A C T I V I T Y	WORK	SALE
A	Install Truss	1,181	5,575
B	Set Drive Carriage	981	
C	Set Tracks & Brackets	2,952	12,266
D	Set Newels	984	
E	Set Balustrade Brackets	984	
F	Install Decking	1,184	5,575
I	Install Chains	590	23,974
J	Install Steps	590	
K	Set Floor Plates	984	1,673
L	Install Skirt Boards	2,952	1,673
M	Set Hand Rails	394	2,788
N	Adjustments	984	--
O	Install Interior Panels	1,181	See - L
P	Cleanup	394	--
	WORK CONCURRENT WITH ABOVE		
G	Set Machine & Controller	590	See - C
H	Wiring	1,574	2,230
Q	Wiring (Electricians)	1,181	
	TOTAL	19,680	55,754

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ESCALATOR INSTALLATION

PRICES FOR
ESCALATORS NO. B9 - B10

ACTIVITY	WORK	SALE
A Install Truss	1,228	5,864
B Set Drive Carriage	1,023	
C Set Tracks & Brackets	3,069	12,902
D Set Newels	1,023	
E Set Balustrade Brackets	1,023	
F Install Decking	1,228	5,864
I Install Chains	614	25,218
J Install Steps	614	
K Set Floor Plates	1,023	1,759
L Install Skirt Boards	3,069	1,759
M Set Hand Rails	409	2,932
N Adjustments	1,023	
O Install Interior Panels	1,228	See L
P Cleanup	409	
WORK CONCURRENT WITH ABOVE		
G Set Machine & Controller	614	See C
H Wiring	1,637	2,346
Q Wiring (Electricians)	1,228	
TOTAL	20,462	58,644

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ESCALATOR INSTALLATION

PRICES FOR
ESCALATORS NO. K1

	A C T I V I T Y	WORK	SALE
A	Install Truss	661	3,159
B	Set Drive Carriage	551	
C	Set Tracks & Brackets	1,650	6,949
D	Set Newels	551	
E	Set Balustrade Brackets	551	
F	Install Decking	661	3,159
I	Install Chains	330	13,580
J	Install Steps	330	
K	Set Floor Plates	551	948
L	Install Skirt Boards	1,652	948
M	Set Hand Rails	220	1,579
N	Adjustments	551	--
O	Install Interior Panels	661	See - L
P	Cleanup	220	--
	WORK CONCURRENT WITH ABOVE		
G	Set Machine & Controller	330	See - C
H	Wiring	882	1,263
Q	Wiring (Electricians)	661	
	TOTAL	11,013	31,585

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ESCALATOR INSTALLATION

PRICES FOR
ESCALATORS NO. K2 - K3

ACTIVITY	WORK	SALE
A Install Truss	1,361	5,741
B Set Drive Carriage	1,135	
C Set Tracks & Brackets	3,405	12,630
D Set Newels	1,135	
E Set Balustrade Brackets	1,135	
F Install Decking	1,361	5,741
I Install Chains	681	24,688
J Install Steps	681	
K Set Floor Plates	1,135	1,722
L Install Skirt Boards	3,404	1,722
M Set Hand Rails	454	2,871
N Adjustments	1,135	
O Install Interior Panels	1,361	See L
P Cleanup	454	
WORK CONCURRENT WITH ABOVE		
G Set Machine & Controller	681	See C
H Wiring	1,816	2,296
Q Wiring (Electricians)	1,361	
TOTAL	22,695	57,411

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ESCALATOR INSTALLATION

PRICES FOR
ESCALATORS NO. P1 to P10

ACTIVITY	WORK	SALE
A Install Truss	7,002	41,972
B Set Drive Carriage	5,835	
C Set Tracks & Brackets	17,502	92,339
D Set Newels	5,835	
E Set Balustrade Brackets	5,835	
F Install Decking	7,002	41,972
I Install Chains	3,501	180,480
J Install Steps	3,501	
K Set Floor Plates	5,835	12,592
L Install Skirt Boards	17,505	12,592
M Set Hand Rails	2,334	20,986
N Adjustments	5,835	
O Install Interior Panels	7,002	See L
P Cleanup	2,334	
WORK CONCURRENT WITH ABOVE		
G Set Machine & Controller	3,501	See C
H Wiring	9,337	16,789
Q Wiring (Electricians)	7,007	
TOTAL	116,703	419,722

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ESCALATOR INSTALLATION

PRICE FOR
ESCALATORS NO. P11 to P 18

	A C T I V I T Y	WORK	SALE
A	Install Truss	5,070	28,999
B	Set Drive Carriage	4,225	
C	Set Tracks & Brackets	12,677	63,798
D	Set Newels	4,225	
E	Set Balustrade Brackets	4,225	
F	Install Decking	5,070	28,999
I	Install Chains	2,535	124,696
J	Install Steps	2,535	
K	Set Floor Plates	4,225	8,700
L	Install Skirt Boards	12,677	8,700
M	Set Hand Rails	1,690	14,500
N	Adjustments	4,225	--
O	Install Interior Panels	5,070	See - L
P	Cleanup	1,690	
	WORK CONCURRENT WITH ABOVE		
G	Set Machine & Controller	2,535	See - C
H	Wiring	6,760	11,600
Q	Wiring (Electricians)	5,070	
	TOTAL	84,504	289,992

BILLING SCHEDULE
CONFORMING TO CRITICAL PATH
NETWORK FOR ESCALATOR INSTALLATION

PRICES FOR
ESCALATORS NO. P19 to P27

ACTIVITY	WORK	SALE
A Install Truss	9,298	78,162
B Set Drive Carriage	7,748	
C Set Tracks & Brackets	23,246	171,957
D Set Newels	7,748	
E Set Balustrade Brackets	7,748	
F Install Decking	9,298	78,162
I Install Chains	4,649	336,099
J Install Steps	4,649	
K Set Floor Plates	7,748	23,449
L Install Skirt Boards	23,246	23,449
M Set Hand Rails	3,099	39,081
N Adjustments	7,748	
O Install Interior Panels	9,298	See L
P Cleanup	3,099	
WORK CONCURRENT WITH ABOVE		
G Set Machine & Controller	4,649	See C
H Wiring	12,397	31,265
Q Wiring (Electricians)	9,298	
TOTAL	154,966	781,624

PROPOSED

New York City Building Department Code

ARTICLE 18

ELEVATORS AND CONVEYORS

May 1, 1967

TABLE OF CONTENTS

Section		Page
1800.0	General	18-1
1800.1	Scope	18-1
1800.2	Standards	18-1
1800.3	Definitions	18-1
1800.4	Plans	18-1
1800.5	Permits	18-1
1800.6	General Requirements	18-1
1800.7	Prohibited Devices	18-3
1800.8	Elevator in Readiness	18-3
1800.9	Acceptance of Equipment	18-3
1800.10	Construction	18-3
1800.11	Alterations	18-4
1801.0	Existing Installations	18-4
1801.1	Retroactive Provisions	18-4
1801.2	Existing Sidewalk Elevators	18-6
1802.0	Tests and Test Interval	18-6
1802.1	Acceptance Tests	18-6
1802.2	Periodic Inspection and Test Intervals	18-6
1802.3	Inspection and Test Requirements	18-7
1802.4	Inspection Agencies	18-8
1802.5	Filing by Owners	18-8
1803.0	Equipment Permits	18-9
1803.1	Permit Required	18-9
1803.2	Temporary Use Permits	18-9
1803.3	Posting of Temporary Use Certificate	18-10
1803.4	Posting of Inspection Certificate	18-10
1804.0	Equipment Operation	18-10
1804.1	Operators	18-10
1804.2	Accidents	18-11

SECTION 1800.0 GENERAL

1800.1 SCOPE - This article shall establish the minimum safety requirements for, and control the design, construction, installation, alteration, maintenance, inspection, test and operation of, all elevators, dumbwaiters, escalators, moving walks, industrial lifts and loading ramps, automotive lifts, mechanized parking garage equipment, console or stage lifts, power operated scaffolds, and special hoisting and conveying equipment.

1800.2 STANDARDS - The provisions of Reference Standard RS-18 shall be a part of this article.

1800.3 DEFINITIONS - For definitions to be used in the interpretation of this article, see Article 2.

1800.4 PLANS - For the requirements governing the filing of plans and the work to be shown on plans, see Article 1.

1800.5 PERMITS - For the requirements governing equipment work permits and equipment use permits, see Article 1.

1800.6 GENERAL REQUIREMENTS - All of the equipment listed in Section 1800.1 shall be designed, constructed, altered and maintained as required by the provisions of this article and Reference Standard RS-18.

(a) Construction Equipment - Except for workmen's hoists the provisions of this article shall not apply to materials hoisting equipment for temporary construction use. For such equipment, the requirements of Article 19 shall apply.

(b) Portable Equipment - The provisions of this article shall not apply to portable elevating devices used to handle materials only except as specifically provided in Reference Standard RS 18-5.

(c) Fire Protection - The fire resistance rating of hoistway enclosures shall be 2 hr. and for hoistway doors and door assemblies the fire protection shall be 1-½ hr. subject to the test procedures of Article 5.

(1) Vertical conveyors passing through floors shall be fire protected as required for shafts in Article 5.

(2) Inclined conveyors passing through floors shall be fire protected as required in Reference Standard 18-1 for escalators which are not a required means of egress.

(3) Horizontal conveyors passing through vertical fire divisions shall be fire protected as required in Article 5.

(d) Elevators Required - For provisions designating building in which elevators are required, see Section _ _ _ .

(e) Elevators Mirrors - In all multiple dwellings in which there are one or more self-service passenger elevators, there shall, pursuant to such regulations as the Commissioner shall prescribe, be affixed and maintained in each such elevator a mirror which will enable persons prior to entering into such elevator to view the inside thereof to determine whether any person is in such elevator.

(f) Emergency Signal Equipment - Elevators, other than private residence elevators, that are operated at any time without a designated operator in the car, shall be provided with emergency signal equipment in accordance with the requirements of Reference Standard RS 18-1.

(g) Elevators and Escalators as Exits - Elevators shall not be accepted as a required means of egress. Elevators shall not be installed in a common enclosure with a stairway. Escalators shall be accepted as equivalent to stairs when they comply with the requirements of Section _ _ _ .

(h) Car Switch Operation - Elevators with car switch operation shall be provided with a signal system by means of which signals can be given from any landing whenever the elevator is desired at that landing.

(i) Electrical Requirements - All electric work shall conform to the Electrical Code of the City of New York.

1800.7 PROHIBITED DEVICES - The installation of manlifts and of sidewalk elevators located outside the street line after the effective date of this code shall be prohibited.

1800.8 ELEVATOR IN READINESS - In every building exceeding 100 ft. in height, at least one elevator shall be kept available for immediate use by the Fire Department during all hours of the night and day, including holidays and Sundays. There shall be available at all times a man to operate the elevator, except that in the case of elevators having automatic or continuous pressure operation, one automatic elevator in each bank shall be provided with a means to permit the Fire Department sole use of the elevator.

1800.9 ACCEPTANCE OF EQUIPMENT - All equipment and devices regulated by the provisions of this article shall be accepted for use in accordance with the requirements of Section ___ ___ ___ .

1800.10 CONSTRUCTION - The construction installation and alteration of all elevator and conveyor equipment and devices, shall be subject to the provisions of this article and applicable reference standards as follows:

(a) Elevators, Dumbwaiters, Escalators and Moving Walks - Reference Standard RS 18-1.

(b) Mechanized Parking Garage Equipment - Reference Standard RS 18-2.

(c) Automotive Lifts - Reference Standard RS 18-3

(d) Industrial Lifts and Hinged Loading Ramps - Reference Standard RS 18-4.

(e) Conveyors - Reference Standard RS 18-5.

(f) Console or Stage Lifts - Reference Standard RS 18-6 and the applicable provisions of Article 10.

(g) Workmen's Hoists - Reference Standard RS 18-7.

(h) Power Operated Scaffolds - Reference Standard RS 18-8.

1800.11 ALTERATIONS - Alterations to elevators, escalators, dumbwaiters and other equipment provided for in this article shall comply with the requirements of Section___. Minor alterations and ordinary repairs shall comply with the requirements of Section__except that elevator work shall not constitute a minor alteration or an ordinary repair when it is classified as alteration by the provisions of Reference Standard RS 18-1.

SECTION 1801.0 EXISTING INSTALLATIONS

1801.1 RETROACTIVE PROVISIONS - The provisions of this article are not retroactive except as specifically provided in this section. Existing elevators moved to new hoistways shall conform with all the requirements for new installations. All work outlined herein must be completed no later than two years after the effective date of this code.

(a) Emergency Interlock Release Switch - Emergency interlock release switches in elevator cars, where provided, shall be of the key-operated, continuous-pressure type and all other types now in use shall be removed or replaced with approved key-operated, continuous-pressure type switches.

(b) Machines - Belt and Chain-Driven - Single-belted and chain-driven machines shall be permitted only on freight elevators and only when equipped with electrically released, spring applied brakes and with terminal stopping devices and electrical safety devices as required in Reference Standard RS 18-1.

(c) Machines - Drum Winding - Drum winding machines shall be equipped with electrical machine limits as set forth in Reference Standard RS 18-1.

(d) Car Gate Switches - Addition, Replacement, or Relocation of - Car gate electric contacts where such devices are not provided or are found to be tied or blocked so as to render them inoperative shall be added, replaced or relocated as required by the Commissioner. *Installation or replacement of car gate electric contacts* shall conform to the requirements of Reference Standard RS 18-1.

(e) Passenger Elevator Hoistway-Door Interlocks - All existing passenger elevators not presently equipped with hoistway doors having door interlocks shall be provided with hoistway landing doors equipped with approved type hoistway-door interlocks conforming to the requirements of Reference Standard RS 18-1. Approved-type interlock switches may be installed in connection with existing hoistway door closers, provided the combination door closers and interlocks conform to all the requirements for approved hoistway-door interlocks. The use of elevator parking devices and hoistway door unlocking devices for opening hoistway doors from the landing side shall conform to the requirements of Reference Standard RS 18-1.

EXCEPTIONS:

Interlocks or electric contacts shall not be used on hydraulic

elevator landing doors or gates except where such elevators are provided with electric control and operating devices.

(f) Emergency Signal or Telephone - Automatic operation elevators or any elevator operated at any time without a designated operator shall be provided with an audible emergency signal, and except in buildings classified in Occupancy Groups H-1, H-2, J-1, and J-2, the cars shall be provided with a telephone, in accordance with the requirements of Reference Standard RS 18-1.

(1) Elevators with car switch operation shall be provided with a signal system by means of which signals can be given from any landing whenever the elevator is desired at the landing.

(g) In all multiple dwellings in which there are one or more self-service passenger elevators, there shall be affixed and maintained in each such elevator a mirror in accordance with the requirements of Section 1800.6 (e).

1801.2 EXISTING SIDEWALK ELEVATORS - Existing sidewalk elevators shall not be subject to the provisions of this section.

SECTION 1802.0 TESTS AND TEST INTERVAL

1802.1 ACCEPTANCE TESTS - No new, relocated or altered equipment shall be placed in operation until it has been tested and an equipment use permit has been issued by the Commissioner. Such tests shall be made as required in Section 1802.3 and shall be conducted by the person or firm installing, relocating or altering the equipment and shall be witnessed by a representative of the Commissioner.

1802.2 PERIODIC INSPECTION AND TEST INTERVALS - Every new and existing device listed in Section 1800.0 shall be inspected and tested at least at the following intervals:

(a) Passenger elevators - every 3 months and freight elevators every 6 months except:

(1) Car safeties and counterweight safeties, where provided, shall be tested at intervals not exceeding 2 years.

(2) Oil buffers shall be tested at intervals not exceeding 6 months.

(3) Hydraulic elevator pressure tanks and the piston rods of roped hydraulic elevators every 3 years.

(b) Escalators - every 6 months.

(c) Amusement devices - every 6 months.

(d) Workmen's hoists - every 3 months and immediately following each increase in travel.

(e) Power operated scaffolds - every 6 months and at such times that replacements of parts or major repairs are made.

(f) All other devices - at such intervals as the Commissioner may require.

1802.3 INSPECTION AND TEST REQUIREMENTS - Every new and existing device listed in Section 1800.0 shall be subjected to inspections and test requirements as follows:

(a) Elevators, dumbwaiters and escalators - to the requirements specified in the Reference Standard RS 18-1 except that:

(1) Governor operated elevator car safeties shall be tested with no load in the car at the lowest operating speed.

(2) Instantaneous type car safeties, without governors, operated only as a result of the breaking or slackening of the hoist ropes shall be tested with no load in the car.

(b) Moving walks - to the requirements specified in the Reference Standard RS 18-1.

(c) Lifts, conveyors, and amusement devices shall be inspected and subjected to the test requirements of the applicable reference standards and shall be tested to confirm the load capacity and safety of operation of the equipment, including tests of all operating protective safety devices, adequacy of the structural supports, and anchorage to floors, walls, ceilings and foundations.

(d) All other devices shall be subject to such inspections and tests as the Commission may require.

1802.4 INSPECTION AGENCIES - The required periodic inspections shall be made by the Department except that two of the four inspections required each year for passenger elevators, and one of the two annual inspections required each year for freight elevators, the inspections for escalators and power operated scaffolds may be made on behalf of the owner by an insurance company, elevator maintenance company, elevator manufacturer, or other person acceptable by the Commissioner. Reports by private inspection agencies may be accepted provided that such agency gives notice to the owner of each elevator inspected listing all violations of any of the provisions of this article, and that a signed copy of the report of each inspection is filed with the Commissioner within 10 days of the inspection on such forms and in such manner as required by the Commissioner.

1802.5 FILING BY OWNERS -

(a) The owner, lessee or agent of each elevator and all other devices listed in this article in use in the City shall file annually with

the Commissioner, on forms supplied by the Commissioner, a written statement as to:

(1) The location of such elevators and other devices.

(2) Whether or not such owner, agent, or lessee has arranged that such elevator, and other devices be inspected by a duly authorized insurance company or inspection organization, and on what date.

(3) Such statements shall be filed with the Commissioner within 30 days after the completion of a new installation and for all elevators and other devices, on or before January First of each year.

SECTION 1803.0 EQUIPMENT PERMITS

1803.1 PERMIT REQUIRED - No construction, alteration or removal shall be commenced until a written work permit therefor shall have been issued by the Commissioner in accordance with the provisions of Section___. No equipment shall be placed in operation until an Equipment Use Permit has been obtained in accordance with provisions of Section___and Section 1802.1.

1803.2 TEMPORARY USE PERMITS - Temporary use permits may be issued by the Commissioner upon request in accordance with the provisions of Section___ for any equipment or device regulated herein, except power operated scaffolds. Temporary use permits for elevators shall be conditioned further upon compliance with the following:

(a) The class of service to be permitted is designated on the temporary permit.

(b) The hoistway has been enclosed throughout in an enclosure complying with Section 1800.6 (b) or with a temporary enclosure in

accordance with the requirements for Workmen's Elevators (temporary elevators) of the Industrial Code of the State of New York, Rule No. 23.

1803.3 POSTING OF TEMPORARY USE CERTIFICATE - The temporary operating certificate shall be posted in a conspicuous location on, or adjacent to, the device covered by the certificate and shall state that the device has not been finally approved by the Commissioner.

1803.4 POSTING OF INSPECTION CERTIFICATE - At the time the equipment use permit is issued, an inspection certificate issued by the Commissioner shall be posted. The certificate shall be in such form as determined by the Commissioner and shall be posted in the car of every passenger and freight elevator and on or near every escalator and power operated scaffold and in a frame with a transparent cover.

SECTION 1804.0 EQUIPMENT OPERATION

1804.1 OPERATORS - Every power driven passenger elevator and freight elevator with a rise of more than one story, except automatic operation and continuous pressure elevators and sidewalk elevators, shall be in charge of a designated competent operator, who shall be at least 18 years old, free from serious physical or mental defects, and selected with consideration of his abilities to perform his duties in a careful and competent manner, and who has been instructed in accordance with the requirements of the Commissioner, except as otherwise specifically provided by law. Operators of amusement devices that require the services of a regular operator shall be at least 21 years of age and shall have secured a certificate of competence from the Commissioner. If the Commissioner finds that any person engaged in running an elevator or amusement device is incompetent, the owner, agent or lessee of such elevator or amusement device shall, upon

notice from the Commissioner, discontinue the operation of such elevator or amusement device by such operator. No person shall be employed or permitted to operate any elevator or amusement device, except as provided in this section, who does not possess the qualifications prescribed therefore by the Commissioner. Other devices listed in Section 1800.0 shall, when deemed necessary by the Commissioner, be in charge of a designated competent operator conforming to such qualifications as the Commissioner may prescribe except that the operators for workmen's hoists shall be assigned as required by the applicable provisions of Reference Standard RS 18-7.

1804.2 ACCIDENTS - The owner or person in charge of the equipment or devices listed in Section 1800.0 shall promptly notify the Commissioner of every accident involving injury to any person requiring the services of a physician or damage to property or to apparatus exceeding $100.00 on, about, or in connection with such equipment, and shall afford the Commissioner every facility for investigating such accident or damage. The Commissioner shall make an investigation immediately thereafter, and shall maintain a full and complete report of such investigation. Such report shall give in detail all material facts and information available and the cause or causes as far as they can be determined. Such report shall be open to public inspection at all reasonable hours. When an accident involves the failure or destruction of any part of the construction or operating mechanism of such equipment, no such equipment shall be used until it has been made safe, and the Commissioner may, if he deems it necessary, order the discontinuance of such equipment until a new use permit has been issued by him

REFERENCE STANDARD RS-18

ELEVATORS AND CONVEYORS

LIST OF REFERENCED NATIONAL STANDARDS

ASA	A10.4	American Standard Safety Code for Workman's Hoist	1963
ASA	A17.1	American Standard Safety Code for Elevators, Dumbwaiters, Escalators, and Moving Walks	1965
ASA	B20.1	American Standard Safety Code for Conveyors, Cableways and Related Equipment	1957
ASA	A113.1	American Standard Safety Code for Mechanized Parking Garage Equipment	1964
CS	142	Commercial Standard for Automotive Lifts	1962
CS	202	Commercial Standard for Industrial Lifts and Hinged Loading Ramps	1956

ASA A17.1 1965 American Standard Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks.

MODIFICATIONS: - The provisions of ASA A17.1 1965 shall be subject to the following modifications. The following paragraph numbers and references are from that standard.

Add the following new paragraph:

"3.43a Platform Guard (Toe guard or apron). A piece of sheet metal the full width of the door opening, securely attached to the car sill and extending downward."

3.45 Private residence shall be construed to be equivalent to the building code definition of Dwelling Unit.

100.5d Delete the last paragraph in its entirety.

101.3c 4 In the first line after the word "metal" add "or concrete".

101.3d After the last sentence of the first paragraph add: "These doors shall have a minimum width of 2 ft. 6 in." Such doors shall have a minimum height of 6 ft. for machine rooms and 2 ft. 6 in. for other spaces specified in Rule 101.4b and c.

102.2 Delete paragraph (2) of Exceptions.

105.4 Delete the first paragraph in its entirety and substitute the following:

"The unit stresses for all machinery and sheave beams and floors and their supports, based on loads computed as prescribed in Rule 105.2, shall not exceed 80% of the allowable stresses for static loads required for structural steel or reinforced concrete in the building code."

105.5 Change this sentence to read as follows:

"The allowable deflections of machinery and sheave beams and their immediate supports, under the loading specified in Rule 105.2a, shall not exceed 1/666 of the span."

106.1d1 Add to the last sentence, "located at the level of the pit floor."

110.1a After the first paragraph add the following:

"and shall be at least 6 ft. 6 in. high and have a clear width of door opening of at least 2 ft. 8 in."

110.1c Add the following paragraph:

"5. Horizontally Swinging Doors of Automatic Operation Elevators. Horizontally swinging doors of automatic operation elevators shall have no hand operated latches or other hand operated door fastening devices, nor shall such doors have any knobs or handles on the hoistway side. Key locks may be provided for locking such doors out of service subject to the requirements of Rule 110.3."

110.14 Add the following new paragraph:

"F. Fixed Ramps. Fixed ramps may be provided where approved by the Commissioner."

111.6d After the last paragraph add the following:

"6. Date of official approval and number or designation, if any of such official approval."

202.4 Delete in its entirety and substitute the following:
"Compensating chains or ropes shall be fastened to the car and to the counterweight frames or to a bracket attached to the frame, and shall not be fastened to the tie rods. In suspending the chains from the frames, provision shall be made for overtravel by looping the chains on "S" hooks attached to the frames or on a bracket attached to the frames."

203.7 In the second paragraph, after the word "Society" delete the remainder of the rule beginning with "At" and substitute:
"The manufacturer shall submit semiannual certification of its welding practices to the Commissioner. Where such manufacturers are located in the City of New York, its welders must be licensed in accordance

with the provisions of the Administrative Code."

203.9 Add the following new paragraph:

e. "A platform guard apron shall be provided on the car of each automatic operation elevator that is without leveling devices. Such apron shall extend at least 9 in. below the top of the car floor for the full width of the opening."

204.1e Add the following new paragraph:

"4 Where a false ceiling or other obstruction is provided in the car it shall have a movable section that will permit free passageway through the top emergency exit.

"5 A guard rail shall be provided where the space between the car enclosure and the nearest wall surface exceeds 8 in. This rail shall be level with the top of the crosshead on the side of the enclosure roof where the emergency exit is located.

"Exception: The Commissioner may permit smaller openings where the size of the car will not permit openings of the size required."

204.1h Add the following paragraph:

"5. Mirrors in cars in multiple dwellings, located to permit a view of the inside by persons entering the car."

204.1i Exceptions: Add the following new paragraph:

"(3) Small directories and signs relating to building operations."

204.2d Add the following to paragraph 5:

"Automatic operation elevators located in multiple dwellings shall, in addition to the locks specified have the side emergency exit doors provided with a tumbler type lock of at least the 5-pin type. This lock shall shall be operable from inside the car only by means of a specially shaped removable key and from outside the car by means of a non-removable handle."

204.4k Add the following to the end of this paragraph:

"Such doors or gates shall be arranged so that they can be opened manually when the car is at rest in case of emergency."

Add the following new paragraph:

"204.7g Provision for Lights on Top of and Beneath Cars.- Either a light receptacle or an outlet for an extension light cord shall be provided in an accessible location under the car platform and on top of the car for inspection purpose."

210.2e At the end of this paragraph add the following: "and, in elevators that are operated at any time without a designated operator in the car, shall cause the alarm bells to sound as required by Rule 211.1".

210.5 First paragraph - delete in its entirety and substitute the following: "An externally operable switch or circuit breaker disconnecting all wires of the motor circuit, or a remote control switch operating a circuit breaker disconnecting all of the wires of the motor circuit, shall be located within sight of the motor unless special permission to locate it elsewhere is given by the Commissioner. Where the elevator is controlled by controlling the field of a generator, this requirement shall be interpreted to apply to the switch in the circuit supplying the motor which drives the generator.

Disconnect switches of direct current rheostatic control elevators shall have the disconnect switch arranged so that its opening will open the power feed lines to the driving machine brake."

210.8 Add the following paragraph:

"d. The power-supply line disconnect switch of direct current elevators having rheostatic control is opened."

211.1 Delete the text in its entirety and substitute the following:

"Elevators located in buildings, other than private residence elevators, that are operated at any time without a designated operator in the car shall be provided with electric signal bells. The signal bells shall be:

1. No less than 6 in. in diameter.

2. Operated from a button inside the car marked "ALARM".

3. Located outside the hoistway.

4. Audible in a room or space in which any employee is ordinarily located.

5. Operated by the opening of the car emergency stop switch as specified in Rule 210.2.e.

6. Only one bell located outside the hoistway shall be required for a group of elevators if operable from all cars in the group.

7. An additional signal bell not less than 6 in. in diameter shall be provided and located on the underside of each car platform.

8. All required bells shall ring whenever either the alarm buttom inside the car is operated or when the car emergency stop switch is opened (See Rule 210.2.e.).

211.2 Additional Emergency Signal Devices Required: - Where the elevators referred to in this section are located in buildings other than multiple dwellings, hotels, or similar residential buildings in which attendants, watchmen, or tenants are not continuously in the building and available to take action in case the emergency signal is operated, they shall be provided with a telephone connected to a central exchange system, or to an approved emergency service that operates 24 hr. a day. In the event that this service is discontinued, the emergency service

shall notify the Commissioner promptly of the date of such discontinuance.

218.8 Delete in its entirety and substitute the following:

"Lengthening, Repairing, or Replacing Wire Ropes - Suspension, compensating, or governor wire ropes shall not be lengthened or repaired by splicing. Any worn suspension rope in a set shall be sufficient reason for causing all ropes in the set to be replaced."

310.7 Add the following new paragraph:

"e. When welded fastenings for brackets and/or rails are used."

Add the following new paragraphs:

"503.18j Screw Machines. Screw machines, where used, shall conform to Rule 208.9.

"503.18k Electrohydraulic Machines. Electrohydraulic machines, valves, piping, connections, and tanks shall conform to Rules 317.1 through Rule 319.3."

Add the following new paragraph:

"503.20f Use of Springs. Springs where used to actuate switches, contractors, or relays to break the circuit to stop an elevator at the terminal landings shall be of the compression type."

503.21g At the end of this paragraph add the following: "When any suspension rope or chain is replaced, all ropes or chains in the set shall be replaced."

503.21i At the end of this paragraph add the following:

"Tapered babbitted sockets and the method used to babbitt the ropes in the sockets shall conform to Rule 212.9."

Part VI Scope. First line delete the words "passenger and".

603.1b Delete paragraph 2 in its entirety.

Table 703.1 Change to the following:

Net Platform Area in Square Feet	Structural Capacity Load in Pounds
2	20
3	50
4	100
5	150
6-1/4	300
9	500

Add the following new paragraph:

"802.5e Dimensions of Steps in Horizontal Run at Lower End - When the nose line of a step at the lower end of a descending escalator is 12 in. from the line of the combplate teeth, the step tread surface shall be not more than 1/2 in. above the surface of the preceding step and the nose line shall be at least 4 in. from the line of the combplate teeth, when the step becomes level with the plane upon which it will enter the combplate."

806.2 Second line, delete "two (2)" and substitute "five (5)."

806.4b Fourth line, after the word "type", add "and shall be located in the space containing the driving machine."

806.4b Delete the second paragraph in its entirety.

Section 1206 First paragraph, second line, after the word "safeties" add "with rated load."

REFERENCE STANDARD RS 18-3

Commercial Standard CS 142 1962 Automotive Lifts

REFERENCE STANDARD RS 18-4

Commercial Standard CS 202 1956 Industrial Lifts and Hinged Loading Ramps

MODIFICATIONS - The provisions of CS 202 1956 shall be subject to the following modifications. The paragraph numbers are from that standard.

4.3 Delete the second line in its entirety, and substitute:

"The manufacturer shall submit a semiannual certification of its welding practices to the Commissioner. Where such manufacturers are located in the City of New York, its welders must be licensed in accordance with the provisions of the Administrative Code."

Add the following new paragraph:

"4.8 Lighting - The entire operating area shall be illuminated to provide a distributed intensity of at least five (5) foot-candles over the area of operating floor and platform."

REFERENCE STANDARD RS 18-5

ASA B20.1 1957 — American Standard Safety Code for Conveyors, Cableways, and Related Equipment

MODIFICATIONS - The provisions of ASA B20.1 1957 shall be subject to the following modifications. The paragraph numbers are from that standard.

2001 g. Delete in its entirety and substitute the following:

"Whenever a conveyor or other material-handling device is designed to pass through floors, ceilings, partitions or walls, the plans and specifications shall give the necessary details of the opening protection with respect to location, structural strength, and fire resistance in accordance with the requirements of the building code."

2001 Add the following new paragraphs:

"h. Machinery Guards - Adequate protection shall be provided around all moving parts of every conveying device including emergency stop buttons."

"i. Conveyor Safeties - All power operated conveyors, belts, and other material-moving devices shall be equipped with automatic limit switches that will shut off the power in an emergency and automatically stop all operation of the conveyors."

REFERENCE STANDARD RS 18-6

Console or Stage Lifts

1. PLATFORM OR CAR CONSTRUCTION

(a) Suspension or supporting frames of all console or stage lifts shall be constructed of structural steel or wrought iron shapes, or of any noncombustible material of equivalent strength, strongly bolted, riveted, or welded together.

(b) The minimum factor of safety of all materials used in car platforms and slings shall conform to the requirements of Reference Standard RS 18.1.

2. CABLES - Hoisting cables shall have a safety factor conforming to the requirements of Reference Standard RS 18.1.

3. HOISTING - Platforms may be operated by cables, plunger, or screw type equipment, and shall maintain a minimum factor of safety of all materials used in operating the platform conforming to the requirements of Reference Standard RS 18.1.

4. CONTROL

(a) Up and down control shall be provided near the lift in a location where it can be easily operated and where the operator will have an unobstructed view of the lift.

(b) An emergency stop switch shall be provided within easy reach of the operator, and when operated, it shall cut off power from the hoisting equipment.

5. ENTRANCE - When the entrance to such console or stage lift is at one or more points below the stage level, such entrance or entrances shall be provided with a gate or door with mechanical lock and electric

contract, or the platform shall be provided with an apron made of sheet steel or plywood covered with 26 gauge sheet steel, at the entrance side or sides extending from the platform to below the lowest landing with the platform at its maximum raised position. If the platform rises above the stage level, all unguarded sides shall be provided with aprons extending from the platform to below the stage level.

REFERENCE STANDARD RS 18-7

ASA A10.4 1963 American Standard Safety Code for Workmen's Hoists

REFERENCE STANDARD RS 18-8

Power Operated Scaffolds

1. CONSTRUCTION REQUIREMENTS FOR THE SCAFFOLD

(a) The scaffold shall be constructed of steel conforming to Reference Standard RS 18-1, Rules 203.6(a), (b), (c), and 203.7, or of equivalent metals.

(b) A railing with an intermediate horizontal rail, shall be provided on all four sides of a scaffold. The railing shall be at least 36 in. high on the building side and at least 42 in. high on the other three sides. Design of the guard rail at both ends of the scaffold shall include provisions for mounting roller guides.

(c) The spaces between the top guard rails and the scaffold toe board on the outside railing and the end railings shall be filled with metallic mesh, expanded metal, or similar material that shall reject a ball 1 in. in diameter and that shall be capable of withstanding a horizontal force of 75 lbs. at any point with a maximum deflection of 1 in. The railing on the building side shall have mesh below the intermediate rail only.

(d) A solid metal toe board, at least 4 in. high, shall be provided at the floor on all four sides. The bottom of the toe board shall be flush with floor. The toe board shall be capable of withstanding a horizontal force of 75 lbs. at any point with a maximum deflection of 1 in.

(e) A hinged access gate shall be provided in the scaffold railing on the building side. The gate shall be of construction similar to the railing, and the open spaces in the gate shall be filled with material as prescribed in (c) above. With the gate open, the clear width of access shall be at least 18 in.

(f) The gate shall be provided with an interlock that will prevent power operation of the scaffold when the gate is in the open position.

(g) The scaffold dimension parallel with building shall be designated the "length", and shall be measured between the inside surface of the end railings. The dimension perpendicular to the building wall shall be designated the "width", and shall be measured between the inside railing surfaces on the long sides of scaffold. The width of a scaffold shall be at least 28 in. When the building side of the scaffold is of irregular shape, following the contour of a building wall, scaffold "width" shall be measured at the tightest point of the irregularity.

(h) The "rated load of a scaffold shall be 50 plf. The maximum number of occupants permitted simultaneously on a scaffold shall be equal to the inside clear length divided by 5.

(i) The maximum permissible vertical scaffold speed shall be 50 fpm.

(j) The scaffold floor shall have an anti-slip surface with air passage interstices, which must reject a 1/2 in. diameter ball, and shall be designed for a uniform live load of 75 psf. The floor and its supports

and bracings shall be able to withstand a concentrated load of 300 lbs. on any random 4 sq. in. of floor area with a maximum deflection of $\frac{1}{1666}$ of the span.

(k) A manufacturers rating plate shall be mounted conspicuously near the access gate on the scaffold. The plate shall be made of non-corrosive material with letters at least 1/4 in. high etched. stamped, or cast on the surface. It shall state the rated load, the maximum number of occupants, and the manufacturers name and model number.

2. CONSTRUCTION AND DESIGN REQUIREMENTS FOR ROOF CARRIAGE

(a) A movable roof carriage and track system shall be provided to move the scaffold in a horizontal direction. The maximum permissible horizontal speed of the roof carriage shall be 50 fpm.

(b) The roof carriage shall be constructed of steel conforming to Reference Standard RS 18-1, Rules 203.6 (a), (b), and (c), and 207.7, or of equivalent metals, welded, riveted, or bolted together. The roof carriage construction shall be capable of supporting the scaffold and its rated load plus impact loads imposed by motor stall torque and wind forces with a safety factor conforming to Reference Standard RS 18-1, Rules 203.10 and 203.11.

(c) The design of the roof carriage, track, and track support system shall include means to accurately stop and position the roof carriage at predetermined locations that correspond to the locations of the vertical guides on the building wall.

(d) When the roof track system is not a continuous loop and terminal track ends exist, mechanical end barricades shall be provided together with terminal limit switches.

(e) In the design of roof components of buildings where suspended scaffolds and movable roof carriages are to be used, all forces transmitted to the building structure by such equipment shall be added to normal design loads.

3. STABILITY OF ROOF CARRIAGE - The roof carriage and its support system shall be designed and constructed for structural adequacy and required stability to resist overturning moments occurring with a scaffold carrying its full rated load.

(a) Windforce: 30 psf.

(b) All imposing forces that are caused by moving loads shall be doubled for impact.

(c) If the roof carriage is of open structure type, the effect of windforce on interior components shall be considered as the sum of all framing component areas plus mounted equipment areas projected on a plane perpendicular to the wind direction. No component shall be considered as shielding another component along the wind direction if the separating distance is more than 4 times the smallest dimension of the windward component.

4. ACCESS FOR INSPECTION AND MAINTENANCE - Safe and convenient means of access between roof and roof carriage and between roof carriage and scaffold shall be provided, conforming where applicable to Reference Standard RS 18-1 Rule 101.3.

(a) On installations where movable roof carriages are used, the means of access shall be a permanent part of the carriage design and shall be constructed so as to permit stepping on or off the carriage to or from the roof at any carriage position.

(b) Means of access between a movable roof carriage and its

scaffold shall be possible only with the scaffold raised to its top position. Electrical interlocks in the carriage drive motor circuit, and actuated by the scaffold, shall prevent carriage movements until scaffold is in access possition.

5. VERTICAL GUIDING OF POWER OPERATED SCAFFOLDS

(a) Power operated scaffolds shall be guided up and down the face (facade) of a building or structure.

(b) The guiding means shall consist of roller guide shoes engaging vertical guide rails securely attached to the structural members.

(c) Each vertical guide shall be engaged by an upper and a lower roller guide shoe securely attached to the scaffold and its suspension frame. Roller guide shoes shall be spaced at least 48 in. apart vertically. Where the platform is suspended at two points at each end, the vertical guides may be engaged by one guide shoe only.

(d) The two ends of the scaffold shall be supported and hoisted or lowered simultaneously, and means shall be provided to maintain the scaffold approximately at level position at all times to prevent the roller guide shoes from binding on the vertical guides. Out-of-level slope shall not exceed 1/4 in. in 12 in.

(e) Material for vertical guides, suspension frame, and fastenings shall conform to applicable portions of Reference Standard RS 8-1, Section 200.

6. CONSTRUCTION AND DESIGN REQUIREMENTS FOR HOIST MACHINES

(a) A hoist machine, whether mounted on the scaffold or the roof carriage, shall be designed and constructed to maintain its component parts in correct alignment to effectively transmit the imposed drum load into the supporting structure.

(b) Wire ropes shall lead from the drums through suitable fairleads to suspension points when the hoist machine is mounted on the scaffold. Wire ropes shall lead from the drums over suitable deflecting sheaves mounted on outriggers from the roof carriage when the hoist machine is located in the roof car.

(c) Chains, clutches, or friction gearing belts shall not be used to connect the drive motor to the winding drum. It shall be necessary to power drive the drive machine to either raise or lower the scaffold.

(d) Drive motors shall meet the requirements of the Electrical Code of the City of New York and shall:

(1) Lift the scaffold with 125% of the rated load at the rated speed with maximum temperature rise of 50°C per hr.

(2) Provide dynamic braking

(3) Be of weatherproof construction with the motor shaft connected to the input shaft of the speed reducer through a coupling capable of transmitting the motor stall torque.

(e) Guards - All moving, power transmitting, and interacting components of the drive machines shall be effectively guarded to conform to applicable portions of the requirements of Rule 19 of the Industrial Code of the State of New York.

(f) Brakes - Each hoist machine shall be provided with at least two friction brakes applied by a spring or springs and released electrically.

(1) Each brake shall be able to stop and hold the dead weight of the scaffold and 125% of the rated load.

(2) The drum brake shall be adjusted to apply not later than 2 seconds after the drive motor brake at every stopping operation.

(3) At least one brake shall be located at, and applied directly to, the winding drum or an equal strength extension of it. This brake shall have the additional function of reacting to a 40% over-speed actuated by an inertia device or a speed governor, either of which must be reset manually.

(4) The second brake shall be located at, and applied on, the driven side of the motor coupling between the motor and the gear reduction unit.

(5) All parts of the brakes shall be readily accessible for inspection and cleaning.

(g) Gearing - Hoist machines shall be provided with speed reducers between the drive motor and the rope drum. Such speed reducers shall be of the meshing gear type, worm and worm gear type, spur gears type, bevel gears type, or a combination of these types. The speed reducer shall be fully enclosed, adequately lubricated, and sealed to prevent leakage.

(1) Such speed reducers shall conform to the requirements of the American Gear Manufacturers Association Publication No. 151.02, December 1963.

(2) Material used for gears and shafts in speed reducers shall conform to Reference Standard RS 18-1, Rules 208.3, 208.5 and 208.6.

(3) The gearbox shall be provided with oil level indicators and removable cover plates or plugs to permit visual inspection of the full width of the faces of the gear teeth.

(4) A data plate of a material resistant to weather and other corrosive agents shall be mounted on the gearbox, and shall bear

the following information etched or stamped in 1/8 in. high letters:

Mechanical Horsepower----------

Input speed----------R.P.M.

Output speed----------R.P.M.

Service factor----------

Type of lubricant----------

Quantity of lubricant----------Gallons

(h) Drums - Drums for winding up suspension ropes shall have grooves or contact surfaces capable of withstanding the imposed rope pressure without deformation.

(1) The pitch diameter of the drum shall be at least 40 times the diameter of the rope wound on it.

(2) When grooved drums are used and single or multiple layers of rope are wound on the drum, the groove spacing or distance from centerline-to-centerline of adjacent grooves shall be at least 1/16 in. plus the rope diameter.

(3) When a drum without grooves is used and single or multiple rope laying is employed, a level winding device shall be provided to maintain the rope in close wound, parallel lays.

7. SUSPENSION MEANS AND THEIR ATTACHMENT - Scaffolds shall be suspended by by steel wire ropes, with at least one rope supporting the scaffold at, or near, each end. When winding drums are located at the top of travel, the suspension rope fastenings shall be attached to the scaffold; when winding drums are located on the scaffold, the suspension rope fastenings shall be attached to supports at the top of travel; and when a hoist machine with a continuously rotating traction sheave is used at each end of the scaffold, the single suspension rope shall have at least 4 turns

on the sheave for minimum lifting effect, and the rope length shall be equal to the total scaffold travel plus 8 ft. For each suspension rope, an adjacent safety suspension rope shall be provided. The safety suspension rope shall normally run free through a clamping device, that is part of the machine, and the clamping device shall be arranged to automatically grasp and hold the safety rope upon failure of the hoist rope.

(a) Only steel wire ropes with fibre cores, having the commercial classification "Elevator Wire Rope" and of minimum grade "Improved Plow Steel" shall be used for the suspension of scaffolds.

(b) Rope data tag information shall conform to the requirement of Reference Standard RS 18-1, Rule 212.2b.

(c) The number of suspension ropes used, the diameter of the ropes, and the factor of safety shall conform to requirements of Reference Standard RS 18-1, Rule 212.3.

(d) The minimum rope diameter shall be 5/16 in.

(e) Securing of wire rope to winding drums shall conform to requirements of Reference Standard RS 18-1. Rule 212.6.

(f) At least 3 turns of rope shall remain on the winding drum when the scaffold is at the bottom of travel.

(g) Suspension wire ropes shall not be lengthened or repaired by splicing.

(h) Suspension wire rope fastenings at free ends shall conform to the requirements of Reference Standard RS 18-1, Rules 212.9(a), (b), (c), (d), (e), and (f).

(i) Suspension ropes shall be provided with a rust-resistive coating.

(j) Reverse bends in the roping arrangement should be avoided. More than two reverse bends in each rope shall be prohibited.

(k) Means shall be provided to stabilize the suspension ropes to prevent sway and abrasion and, in all cases, such means shall be provided for every 300 ft. of scaffold travel.

8. OPERATING DEVICES AND CONTROL EQUIPMENT

(a) All electrical operating devices shall be of the constant pressure or dead man type with weather proof enclosure. To prevent unauthorized use, the constant pressure device shall be key operated or protected by a padlocked cover.

(b) All electrical equipment and wiring shall conform to the requirements of the Electrical Code of the City of New York.

(c) The normal operating devices for the vertical movement of the scaffold shall be located on the scaffold and shall be operable only when all electrical protective devices and interlocks on the scaffold are in position for normal service.

(d) The operating device of a power operated roof carriage for horizontal traversing shall be located on the roof carriage. This operating device shall be connected so that it will not be operable until the scaffold is raised to its uppermost position of travel and is disengaged from the building face or guiding rails on the building face and all protective devices and interlocks, on both the roof carriage or scaffold mounted hoist machine, are in position for traversing.

9. TRAVELING CABLE

(a) Conductors for control, power, communication, signal, and ground may be run in a single traveling cable, provided that the cable conforms to the requirements of Rule B30-166.0(i) of the Electrical

Code of the City of New York.

(b) Traveling cables exceeding 100 ft. in length shall comply with Rule B30-69.0 of the Electrical Code of the City of New York.

(c) The traveling cable shall be provided with a tensioning device to prevent uncontrolled cable sway, to protect the cable against abrasion, and to automatically prevent overtensioning of the cable. The tensioning device and cable drum shall be mounted in a weather-shielded housing.

10. ELECTRICAL PROTECTIVE DEVICES AND INTERLOCKS

(a) An overtensioning or tightrope device shall be connected into the drive motor circuit in a manner that will cause it to react to an overload and disconnect electric power to prevent upward pull on ropes if the scaffold becomes wedged in its tracks or is otherwise impeded while being raised.

(b) A slack rope device shall be provided that will react to a slackening of rope tension and disconnect electric power from drive motor to prevent the drum from overhauling the suspension rope if scaffold's downward motion is interrupted.

(c) Limit switches shall be provided at the top and bottom terminals of scaffold travel and shall be connected into the control circuits of the drive motors and actuated by cams at both ends of the scaffold and in the roof carriage. Cam engagement of a limit switch at any travel terminal shall remove electric power from the motor circuit, and shall apply the brake to stop the scaffold or roof carriage.

(d) Hoist machine winding drums shall be provided with stop motion limit switches of the traveling nut type or equivalent. Such stop motion limit switches shall be connected to the drum shaft and set to open

the operating circuit of the motors simultaneously with the cam operated final terminal travel limit switches.

(e) All electrical mounting boxes, conduits, piping, and junction boxes, and the controller frame, hoist machinery frame, roof carriage track system, and scaffold shall have a ground connection through a ground wire in the scaffold traveling cable and by a third rail contact or cable with a tensioning device for the roof carriage.

11. POWER SUPPLY SYSTEM - Electrical equipment and wiring for the power supply system shall conform to the applicable requirements of the Electrical Code of the City of New York.

12. EMERGENCY COMMUNICATION WITH MEN ON SCAFFOLD - Communication equipment shall be provided for each power operated scaffold to facilitate rescue operations in an emergency and shall consist of either:

(a) A telephone instrument mounted on the scaffold and connected through wires in the traveling cable to a manned instrument in the building and, in addition, a battery or hand-operated air horn or other signaling device not requiring electricity to operate.

(b) A two-way radio telephone system with the receiving instrument in the building constantly manned during the operation of the scaffold and in addition, a battery or hand-operated air horn or other signaling device not requiring electricity to operate.

13. SPECIAL MAINTENANCE

(a) Suspension ropes shall be examined, lubricated, and shackled or re-shackled to conform to ASA A17.2-1960, Part I, Paragraphs 26, 27, 28, and 29.

WTCF-479-P